March 30, 2012

Mr. Steve Teel
Washington State Department of Ecology
Southwest Regional Office, Toxics Cleanup Program
P.O. Box 47775
Olympia, Washington 98504-7775

Subject: **Supplemental Site Assessment Summary Report**
Cowlitz BP (Cowlitz Food and Fuel) /
Former Texaco Service Station No. 21-1556
101 Mulford Road, Toledo, Washington

Dear Mr. Teel:

SAIC Energy, Environment & Infrastructure, LLC (SAIC), on behalf of Chevron Environmental Management Company (CEMC), prepared this report that summarizes the results of supplemental site assessment activities performed at the above-referenced site (the Site) in Toledo, Washington (Figure 1).

The objectives of the supplemental site assessment activities were:

- Installation of one new groundwater monitoring well (MW-120) in the inactive station portion of the Site, to allow collection of additional groundwater monitoring data to further evaluate the effectiveness of the October 2010 interim remedial action excavation in this portion of the site; and
- Performance of a Tier 1 vapor intrusion (VI) assessment to determine whether petroleum contamination in soil and groundwater in the active station portion of the Site poses a threat to indoor air quality in the existing service station building and/or Mrs. Beesley's restaurant.

Supplemental site assessment activities were generally performed in accordance with the procedures described in SAIC's *Work Plan for Supplemental Site Assessment Activities* (Final Work Plan), dated September 2, 2011, which was approved by the Washington State Department of Ecology (Ecology) by letter dated September 7, 2011. Where deviations in the scope or methods utilized have occurred, a description and justification for the change are provided in this report.

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MONITORING WELL INSTALLATION

Installation of monitoring well MW-120 was performed between October 26 and 28, 2011. Drilling and well installation activities were performed by Cascade Drilling L. P. (Cascade Drilling) of Woodinville, Washington, with oversight by SAIC.

Soil Boring and Sampling

Soil boring techniques utilized for installation of this monitoring well included use of an air-knife vacuum truck rig to clear from ground surface to at least 8 feet below ground surface (bgs), followed by use of a hollow-stem auger (HSA) drill rig to advance the boring beyond 8 feet bgs. Use of the air-knife rig, or similar "soft-dig" boring method between 0 and 8 feet bgs is a best practice required by CEMC to avoid potential damage to subsurface utilities or other infrastructure.

During soil boring activities, an SAIC geologist was present on site to log soils and collect soil samples for field-screening and laboratory analysis. Soil sampling in the upper 8 feet of the boring was performed using a stainless steel hand auger at a sampling interval of approximately 2 feet. Below 8 feet bgs, soil samples were collected using a split-spoon sampler at a sampling interval of approximately 2.5 feet. Soil samples were classified in accordance with the Unified Soil Classification System. In addition, each sample was field screened for the presence of petroleum constituents by visual and olfactory observation, headspace vapor measurements using a photo-ionization detector (PID), and sheen testing. Based on field screening results, three of the soil samples collected were submitted to Lancaster Laboratories, Inc. for the following analyses:

- Total petroleum hydrocarbons (TPH) as gasoline-range organics (GRO) by Washington State Department of Ecology (Ecology) Method NWTPH-Gx;
- TPH as diesel-range organics (DRO) and heavy oil-range organics (HRO) by Ecology Method NWTPH-Dx extended with silica-gel cleanup;
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8021B;
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by USEPA Method 8270 with selective ion monitoring; and
- Lead by USEPA Method 6020.

Soil Sampling Results – MW-120 Installation

A summary of analytical results for soil samples collected during installation of monitoring well MW-120 is included in Table 1, and a complete laboratory analytical report for these samples is included as Attachment A.

As these results indicate, none of the requested analytes were detected at concentrations exceeding their respective MTCA Method A cleanup levels. However, for the bottom-most sample collected (MW-120-18), the method detection limit achieved by the

laboratory was greater than the Method A cleanup level for benzene. The laboratory noted that the reporting limits for this sample were raised due to foaming of the sample.

Monitoring Well Construction and Development

Following completion of soil sampling activities, the boring for MW-120 was completed as a 2-inch-diameter monitoring well. Based on historical groundwater elevation data, and the lithology encountered during advancement of the boring, the well was constructed with a screen interval from 4 to 17 feet bgs. Additional well construction details are presented in the boring log for MW-120, which is included in Attachment B.

SAIC returned to the Site on November 4, 2011 to develop the new monitoring well. Development consisted of alternately surging and pumping the well with an electric submersible pump until the discharge from the pump was visibly clear and free of sediment. Approximately 36 gallons of water were extracted from the well during the development procedure, which equates to approximately 20 well casing volumes, based on groundwater elevation conditions at the time of development.

Monitoring Well Sampling

Groundwater sample collection from monitoring well MW-120 was not included in the scope of work performed under this work plan. Groundwater sampling at this monitoring well will be included as part of future groundwater monitoring events, which will be performed on a quarterly basis by Gettler-Ryan, Inc., on behalf of CEMC. The first quarterly sampling of monitoring well MW-120 was performed from November 7 to 9, 2011. Results of that sampling event were reported in the *Fourth Quarter 2011 Groundwater Monitoring and Sampling Report*, dated February 28, 2012, which was prepared by SAIC.

Monitoring Well Surveying

Groundwater elevation measurements at the Site were previously made relative to an arbitrary site elevation datum set at 100.00 feet. Therefore, in order to comply with current Ecology guidelines for groundwater elevation data reporting, SAIC subcontracted GeoDimensions, a land-surveying firm licensed to practice in the State of Washington, to resurvey the Site. Survey fieldwork was completed on December 1, 2011, and included a location survey of all monitoring wells and major features at the Site. Monitoring well elevation measurements were made to the nearest 0.01 foot at the ground surface (top of well-box lid) and at the top of the well casing, relative to the North American Vertical Datum of 1988 (NAVD88) elevation datum. An updated site map is included as Figure 2.

TIER 1 VI ASSESSMENT

VI assessment activities at the Site were initiated in response to Ecology comments on SAIC's *Draft - Feasibility Study Report* (February 8, 2011). In the comments, Ecology suggested that additional consideration of the potential risk for vapor intrusion to the existing service station building and Mrs. Beesley's restaurant was necessary to complete the exposure pathway evaluation of the FS. To address this comment, CEMC and SAIC

proposed performance of a VI assessment to be consistent with Ecology's October 2009 draft guidance document, *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (Ecology VI guidance).

Per the Ecology VI guidance, a preliminary VI assessment was performed, which indicated that conditions on the active station portion of the Site created the potential for a VI pathway to exist, and that further evaluation in the form of a Tier 1 assessment was warranted. Additional information regarding performance of the preliminary VI assessment can be found in the Final Work Plan.

Because the contaminant distribution at the Site is known to include vadose-zone soil impacts, Ecology VI guidance required use of measured soil-vapor concentrations for the Tier 1 assessment. To accomplish this, the Final Work Plan proposed installation and sampling of four pairs of soil-vapor sampling probes (designated SVSP-1A/B through SVSP-4A/B) to be installed in the vicinity of the service station building and Mrs. Beesley's restaurant, with each pair consisting of a shallow probe installed to a depth of approximately 5 feet bgs and a deeper probe installed to a depth of approximately 10 feet bgs. The location of the soil-vapor sampling probes was selected to ensure that the probes would be located along the south side of each building, closest to the area of known petroleum contamination at the Site.

Soil-Vapor Sampling Probe Installation

Soil-vapor sampling probe installation was performed by Cascade Drilling on October 27 and 28, 2011, with oversight and assistance by SAIC. Construction and installation of the soil-vapor sampling probes were generally conducted in accordance with the methods described in the Final Work Plan, with the exception that none of the four proposed deep probes were able to be installed due to cobbles encountered beyond 6 feet bgs that could not be removed or bypassed. Therefore, only the four shallow sampling probes (SVSP-1A, SVSP-2A, SVSP-3A and SVSP-4A) were installed.

> *Note: Attachment B contains logs for each of the seven borings advanced for soil-vapor sampling probe installation (SVSP-1A through SVSP-4A). No boring was advanced for the proposed SVSP-4B sampling probe, due to the difficulties encountered during attempts to install the other three deep sampling probes. Because only the shallow probes were successfully installed for each of the proposed pairs, the letter designation of the probe ID has been dropped for future reference. Therefore, the completed sampling probes are hereafter simply referred to as SVSP-1, SVSP-2, SVSP-3 and SVSP-4.*

The soil boring for each soil-vapor sampling probe was advanced using a combination of post-hole digger and hand-auger excavation techniques. During boring advancement, soil samples were collected at approximate 2-foot intervals for classification and field screening analysis by an SAIC geologist. For each of the borings completed as a soil-vapor sampling probe, two soil samples were submitted to Lancaster Laboratories, Inc. for the following analyses:

- TPH as GRO by Ecology Method NWTPH-Gx;
- TPH as DRO and HRO by Ecology Method NWTPH-Dx extended with silica-gel cleanup;
- BTEX by USEPA Method 8021B; and
- Grain-size analysis by ASTM Method D422.

A summary of soil sampling analytical results is presented in Table 1 and a complete copy of the laboratory analytical report is included in Attachment A. Results of the sampling analyses indicate that none of the soil samples collected during soil-vapor sample probe installation contained any of the requested analytes at concentrations exceeding MTCA Method A cleanup levels.

Each soil-vapor sampling probe was constructed using a single 6-inch-long, 0.5-inch-diameter, double-woven stainless steel wire screen with a 0.0057-inch (0.15-millimeter) screen pore size, supplied by AMS, Inc. The casing section of each probe was constructed of ¼-inch outside diameter (O.D.) rigid-wall nylon tubing, which was connected to the screen by a Swagelok® compression fitting. The above-grade end of each probe casing was fitted with a stainless-steel Swagelok® on/off control valve, to prevent short-circuiting of ambient air into the probes.

To complete installation of the soil-vapor sampling probes, the screen interval of each probe was centrally placed within a filterpack consisting of approximately 18-inches of 10/20 Colorado silica sand. Approximately 12 inches of dry, granular bentonite was then placed above the filterpack, after which the borehole was filled with pre-hydrated granular bentonite (minimum thickness of 24 inches) to approximately 18 inches bgs. The remaining boring depth was completed with a cement seal (approximately 12-inches thick) and fitted with a 12-inch-diameter traffic-rated flush-mount well vault. Boring logs are included in Attachment B.

Soil-Vapor Sample Collection

SAIC returned to the Site on December 1, 2011 to collect samples from each of the newly installed soil-vapor sampling probes. The sampling event was scheduled to allow sufficient time for equilibration of subsurface conditions following probe installation, and to ensure that sampling was not performed immediately following a significant rain event.

Weather on the day of the sampling event consisted of no precipitation, but relatively foggy conditions, with temperatures around 40 degrees Fahrenheit, and no appreciable wind. Data gathered from weather stations in Olympia, Chehalis, Kelso, and Vancouver confirm that weather in the southwest Washington region on the day of sampling consisted of temperatures ranging from the high twenties to mid-forties, with wind generally less than 5 knots. Barometric pressure trends for Olympia and Vancouver show atmospheric pressure peaking early and then dropping steadily on the day of the sampling event. Cumulative rain records indicate that there was no precipitation on the day of the sampling

event, or within the preceding 24 hours, with the exception of a minor accumulation (less than 0.05 inch) reported from the Vancouver area.

Weather data plots generated using the University of Washington website; http://www-k12.atmos.washington.edu/k12/grayskies/nw_weather.html, are included in Attachment C.

Water level measurements made on the day of the sampling event indicate that groundwater elevation ranged from approximately to 6.3 to 8.3 feet bgs in the vicinity of the active service station. Water elevation data are presented in Table 2.

Soil-vapor samples were collected in 1-liter Summa air-sampling canisters (Summa canisters) provided by Air Toxics Ltd. (Air Toxics) laboratory of Folsom, California. Each Summa canister used for sample collection was individually certified (100-percent certified) to contain less than the reporting limit for each of the target compounds. Prior to sample collection, the initial vacuum of each Summa canister was measured to verify that the canister had not leaked or been inadvertently opened prior to the sampling event, and the initial vacuum was recorded on the canister's identification tag and on a field data form specific to the sampling location.

Following the initial canister vacuum check, each sampling canister was fitted with a sampling manifold, to allow the sampling canister to be connected to another canister used for purging the sampling probe and sample collection train. The manifold was also equipped with a filter and a flow restrictor that was calibrated to provide a sampling flow rate of approximately 167 milliliters per minute (mL/min).

After connecting the sampling manifold and purge canister, a preliminary leak check of the system was performed. With the inlet to the manifold tightly capped, the purge canister was opened momentarily and then shut, thereby applying a vacuum to the sampling manifold. Initial vacuum readings were then recorded from the two vacuum gauges on the sampling manifold. After a period of approximately 5 minutes, the vacuum readings of each gauge were checked again to verify that the initial vacuum levels had been maintained, indicating that there were no leaks present. Each canister/manifold combination was checked and verified to be leak-free by this method prior to being used for sample collection.

Following completion of the preliminary leak check, the sampling manifold was connected to the soil-vapor sampling probe using rigid-wall ¼–inch O.D. nylon tubing. Swagelok® compression fittings were used to make connections from the nylon tubing to the control valve and sampling manifold inlet.

As a secondary check for leaks or short circuiting, helium was used as a tracer gas to test for ambient air leakage into the sampling system. To accomplish this, the entire soil-vapor sampling train (soil-vapor sampling probe, sampling manifold, sampling canister, and purge canister) was covered by a shroud, into which laboratory-grade helium gas was pumped to create, and maintain, a helium-rich environment throughout the duration of the sample collection. During the duration of the sampling, the concentration of helium inside the shroud was monitored using a Mark 9822 helium detector, in order to maintain a

concentration of at least 10 percent helium in the sampling shroud. Figure 4 shows a typical example of the sampling equipment configuration, including the leak-detection tracer gas shroud.

Prior to collecting soil-vapor samples, each soil-vapor sampling probe was purged to remove stagnant and/or ambient air from the sample collection train. The purge volume used was based on the volume of air contained within the inner diameter of the soil-vapor sampling probe and all tubing connected to the inlet of the sampling canister. The sand pack volume of the soil-vapor sampling probe was not included in the purge volume calculation, as it is assumed that the soil-vapor concentration in the sand pack would be in equilibrium with the surrounding soil. At least three purge volumes were extracted from each soil-vapor sampling probe prior to sample collection, which equates to a purge time of approximately one minute, assuming use of 10 feet of ¼-inch O.D. (0.15-inch I.D.) tubing.

Following completion of the purge cycle, the valve on the sampling canister was opened to begin sample collection, and the start time and initial canister vacuum were recorded on the field data form. Collection of each sample required approximately 10 minutes, during which time the sampling technician periodically checked the canister vacuum to verify that the canister was filling at the expected rate. The sampling technician also monitored and maintained the concentration of helium leak-detection gas within the sampling shroud. Sample collection was stopped when the vacuum gauge on the sampling canister indicated that approximately 3 inches of mercury vacuum remained in the sampling canister. Once sample collection was complete, the final canister vacuum was recorded on the canister identification tag and also on the field data form.

In order to verify sample collection and laboratory quality assurance and quality control (QA/QC), one equipment blank and one duplicate soil-vapor sample were collected. The QA/QC equipment blank was collected by passing laboratory-certified nitrogen through a representative length of nylon tubing, stainless-steel Swagelok® valve, and a sample collection manifold, into a 1-liter Summa canister. The QA/QC duplicate sample was collected using a duplicate-sampling manifold, which allowed two sample collection canisters to be filled simultaneously in a parallel configuration. The duplicate sample was collected at the SVSP-2 location.

Soil-vapor samples were submitted to Air Toxics for the following analyses:

- BTEX, methyl tert-butyl ether (MTBE), and naphthalene by USEPA Method TO-15 (Low Level); and
- Oxygen, carbon dioxide, methane, nitrogen, and helium by ASTM D1946.

Soil-Vapor Sampling Results

A summary of soil vapor sampling results is presented in Table 2, and complete copies of the laboratory analytical reports are included in Attachment D.

Results of the TO-15 analyses indicate that benzene was present in both of the samples collected at SVSP-2 (SVSP-2-120111 and Duplicate-120111), each at a concentration of 340 micrograms per cubic meter (µg/m^3), which exceeds the draft Method B soil gas screening level for this compound (3.2 µg/m^3). Benzene was also detected in the samples collected at SVSP-3 and SVSP-4, which are located to the south of the Mrs. Beesley's restaurant building. However benzene detections at these locations did not exceed the draft screening level.

None of the other compounds analyzed for were confirmed to be present at concentrations exceeding their respective draft screening levels. However, the concentration of naphthalene in samples collected at SVSP-2 could not be confirmed below the screening level due to the presence of high level non-target species in these samples, which resulted in interference and an elevated reporting limit for these samples.

Results of the ASTM D1946 analyses indicate that helium was not detected in any of the samples collected. These results suggest that there were no leaks of atmospheric ambient air into any of the samples collected, either through sample-train connections or due to short-circuiting between the vapor probes and the ground surface.

Oxygen concentration results for samples collected at SVSP-1 and SVSP-2, which ranged from 4.3 to 7.6 percent, were sufficiently high to suggest that vadose zone oxygen content in the vicinity of the active service station building is favorable to promote biodegradation of BTEX constituents, which are known to biodegrade significantly in the vapor phase.

For the laboratory QA/QC sample (Duplicate-120111), analytical results correlated well with the results for SVSP-2-120111. The field QA/QC sample (Equipment Blank) was found to contain relatively low levels of toluene and m,p–xylene. Toluene and m,p–xylene were also detected in the soil-vapor samples collected at SVSP-2, SVSP-3 and SVSP-4, but at significantly greater concentrations than in the Equipment Blank. Therefore, the detections of toluene and m,p–xylene at these three locations is not likely attributable to equipment or sampling procedures.

Johnson and Ettinger Modeling

Per Ecology VI guidance, in cases where Tier 1 soil gas sampling results exceed screening levels, Ecology allows use of the Johnson and Ettinger Model (JEM) to evaluate the potential for vapor intrusion into existing or proposed buildings, prior to requiring performance of a Tier II assessment. To accomplish this, the JEM model is used to predict the maximum indoor air concentration that would result from a worst-case measured soil vapor sampling result. The predicted indoor air concentration can then be compared to the indoor air cleanup levels presented in Table B-1 of the Ecology VI guidance. In situations where the indoor air concentration predicted is less than the indoor air cleanup level, further VI assessment would not be necessary.

Based on the analytical results for soil-vapor samples collected at SVSP-2, which contained benzene at a concentration of 340 µg/m^3, SAIC used the JEM to predict the maximum concentration of benzene that could be expected in the existing service station

building. A technical memorandum presenting the methodology and results of the modeling exercise is included as Attachment E.

Results of the modeling suggest that current maximum levels of benzene measured in soil gas would not result in benzene concentrations in indoor air of the existing service station building in excess of cleanup levels, based on an adult worker exposure scenario (i.e., Method C). However, additional VI assessment would likely be warranted under a different future land use with a more conservative exposure scenario. Additional discussion of the JEM modeling results in included in the attached memorandum, and in the Conclusions section of this report.

CONCLUSIONS

On the inactive service station portion of the Site, the supplemental site assessment activities were successful in completing installation of monitoring well MW-120. With the exception of the inconclusive laboratory results for benzene in soil sample MW-120-18, soil sampling data collected during installation of this well indicate that this area does not contain petroleum hydrocarbon impacts in excess of cleanup levels. Future groundwater monitoring data from this location will be used to evaluate the effectiveness of past remedial actions in this portion of the Site.

In the vicinity of the active service station building, shallow soil samples did not contain petroleum constituents at concentrations in excess of screening levels; however, soil-vapor sampling results did indicate the presence of benzene in soil vapor at a concentration exceeding the Ecology draft screening level. Vadose zone oxygen concentrations measured at sampling probes in this area of the Site suggest that conditions are favorable for significant biodegradation of BTEX constituents, and further VI assessment performed using the JEM indicates that maximum indoor air concentrations in the existing service station building would not exceed indoor air cleanup levels based on an adult worker exposure scenario. If land use at the Site changes in the future such that a more conservative exposure scenario is applicable, further VI assessment may be warranted.

Soil sampling data collected in the vicinity of Mrs. Beesley's restaurant indicate that shallow soil samples did not contain petroleum constituents at concentrations exceeding cleanup levels. Results of the soil-vapor sampling in this area were also in compliance with Ecology draft screening-levels for soil gas. Based on these results, it appears that subsurface contamination at the Site is not likely to pose a VI threat to this building.

If you have any questions or comments regarding the activities described by, or the information presented within, this summary report, please contact me at (425) 482-3323 or via email at russell.s.shropshire@saic.com.

Sincerely,

SAIC Energy, Environment & Infrastructure, LLC

Russell S. Shropshire, PE
Senior Project Engineer

Enclosures:

Figure 1 – Vicinity Map
Figure 2 – Site Map
Figure 3 – Site Map – Active Station Property

Table 1 – Summary of Soil Sampling Analytical Results
Table 2 – Summary of Groundwater Elevation Data
Table 3 – Summary of Vapor Sampling Analytical Results

Attachment A – Laboratory Analytical Reports – Soil
Attachment B – Boring Logs
Attachment C – Weather Data Plots
Attachment D – Laboratory Analytical Reports – Vapor
Attachment E – Johnson and Ettinger Vapor Modeling Memorandum

cc: Mr. Mark Horne – CEMC
Mr. Charles Vineyard – Property Owner
Mr. John Houlihan – Houlihan Law

REPORT LIMITATIONS

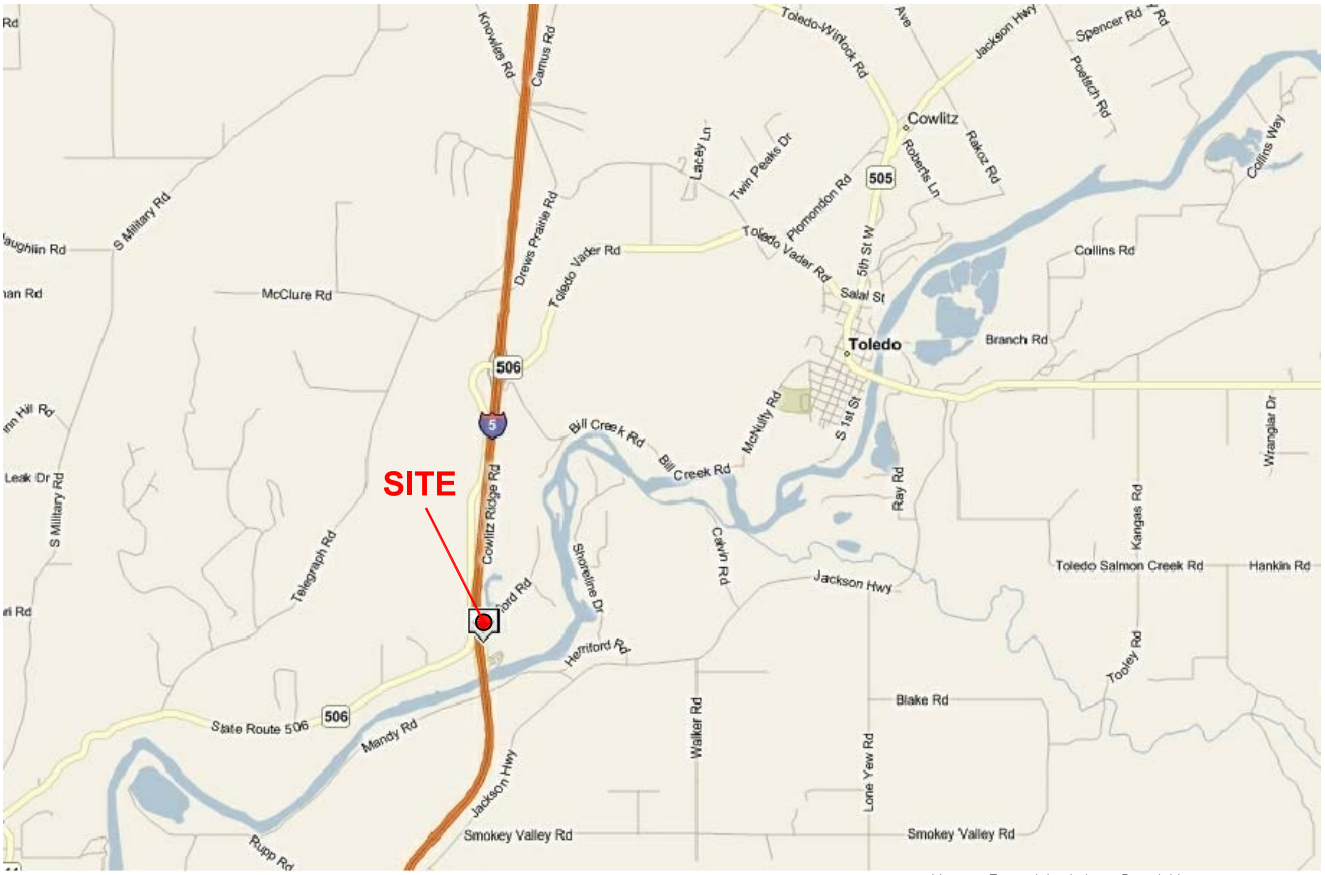
This technical document was prepared on behalf of Chevron and is intended for its sole use and for use by the local, state or federal regulatory agency that the technical document was sent to by SAIC. Any other person or entity obtaining, using, or relying on this technical document hereby acknowledges that they do so at their own risk, and that SAIC shall have no responsibility or liability for the consequences thereof.

Site history and background information provided in this technical document are based on sources that may include interviews with environmental regulatory agencies and property management personnel and a review of acquired environmental regulatory agency documents and property information obtained from CEMC and others. SAIC has not made, nor has it been asked to make, any independent investigation concerning the accuracy, reliability, or completeness of such information beyond that described in this technical document.

Recognizing reasonable limits of time and cost, this technical document cannot wholly eliminate uncertainty regarding the vertical and lateral extent of impacted environmental media.

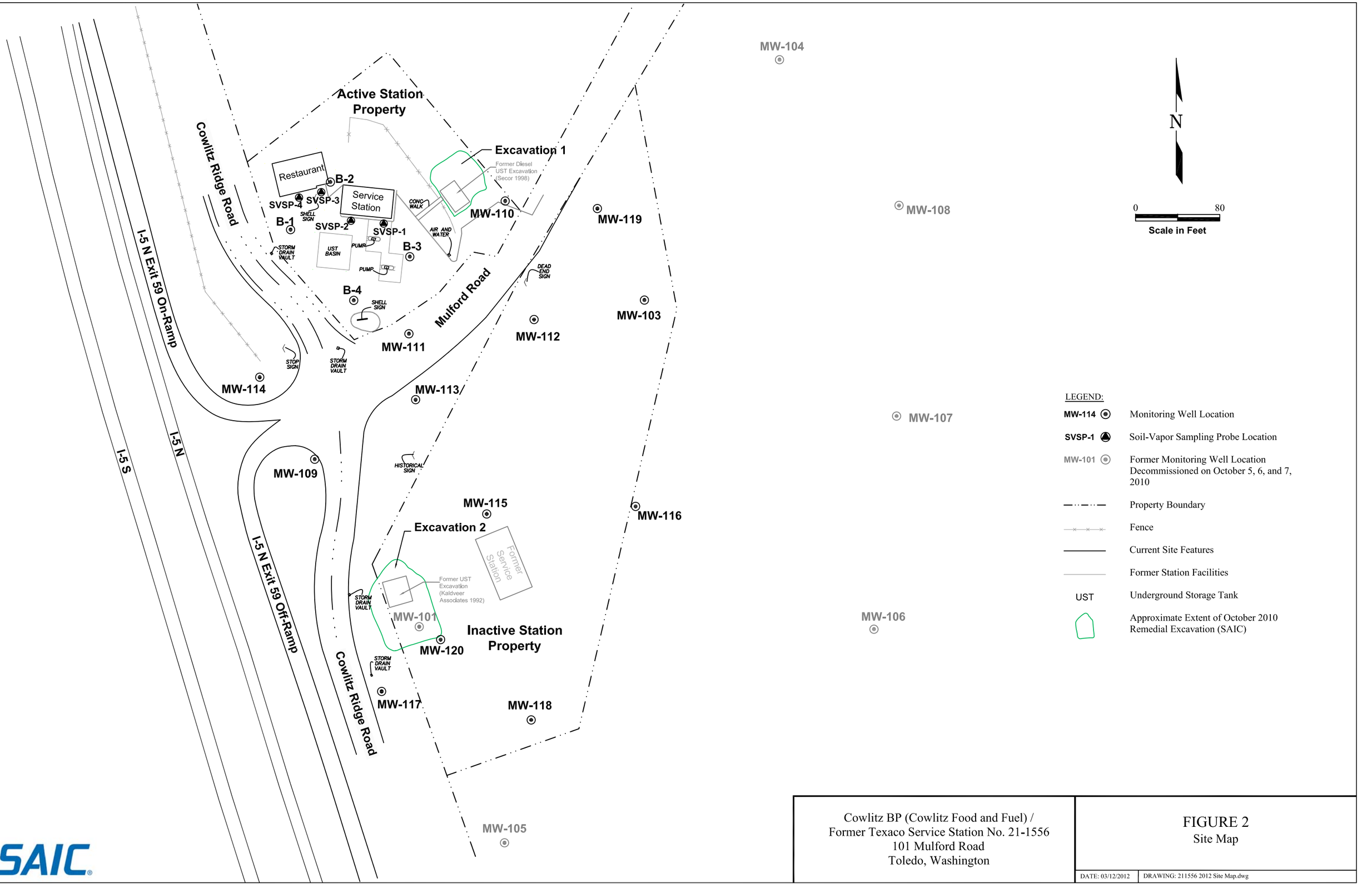
Opinions and recommendations presented in this technical document apply only to site conditions and features as they existed at the time of SAIC's site visits or site work and cannot be applied to conditions and features of which SAIC is unaware and has not had the opportunity to evaluate.

All sources of information on which SAIC has relied in making its conclusions (including direct field observations) are identified by reference in this technical document or in appendices attached to this technical document. Any information not listed by reference or in appendices has not been evaluated or relied upon by SAIC in the context of this technical document. The conclusions, therefore, represent our professional opinion based on the identified sources of information.



Maps Provided by Seattle.gov

SAIC	Cowlitz BP (Cowlitz Food and Fuel) / Former Texaco Service Station No. 21-1556 101 Mulford Road Toledo, Washington	FIGURE 1 Vicinity Map FILE NAME: 211556_VM.dwg DATE: 10/05/2011



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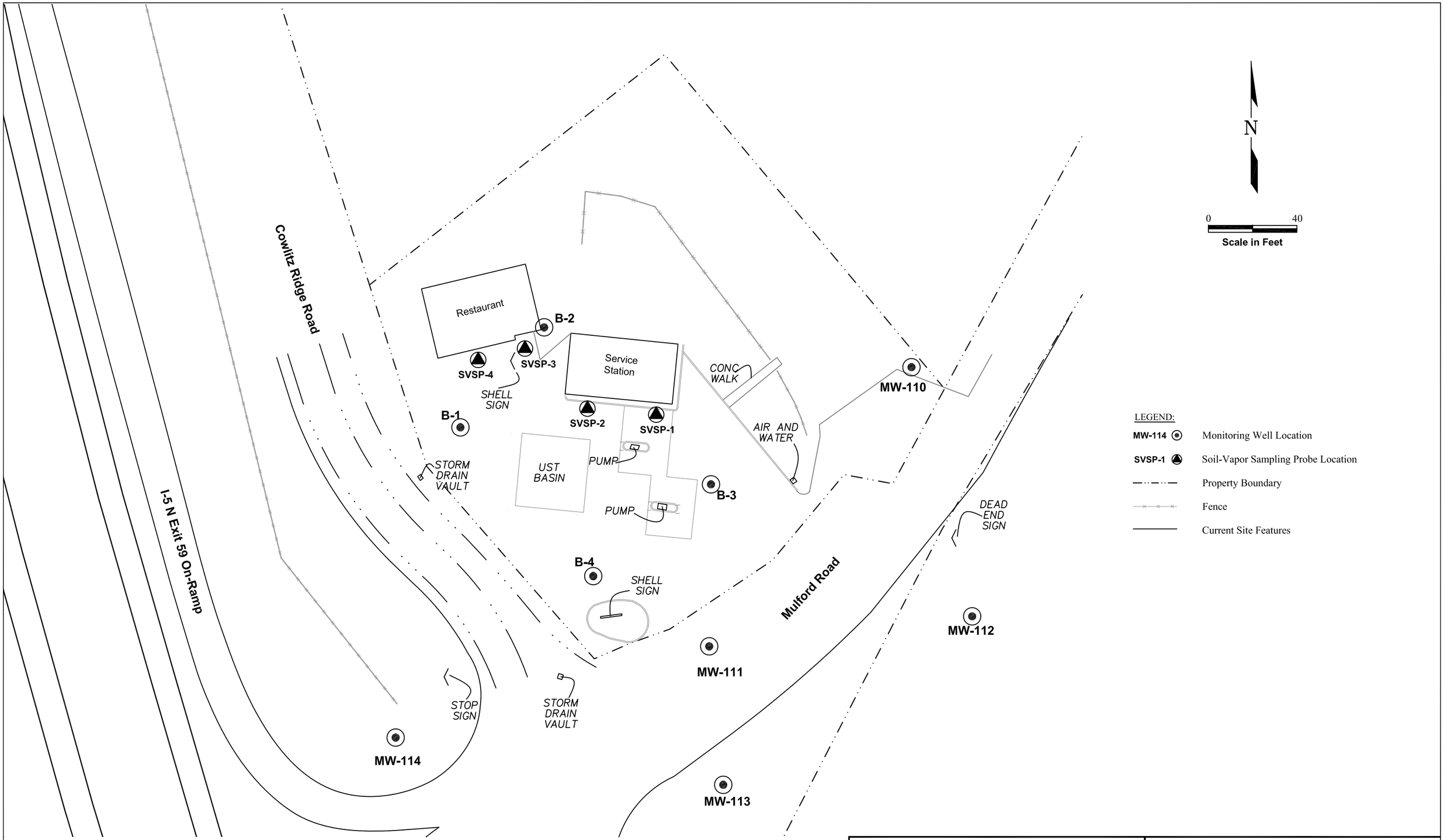
Cowlitz BP (Cowlitz Food and Fuel) /
Former Texaco Service Station No. 21-1556
101 Mulford Road
Toledo, Washington

FIGURE 2
Site Map

DATE: 03/12/2012 | DRAWING: 211556 2012 Site Map.dwg



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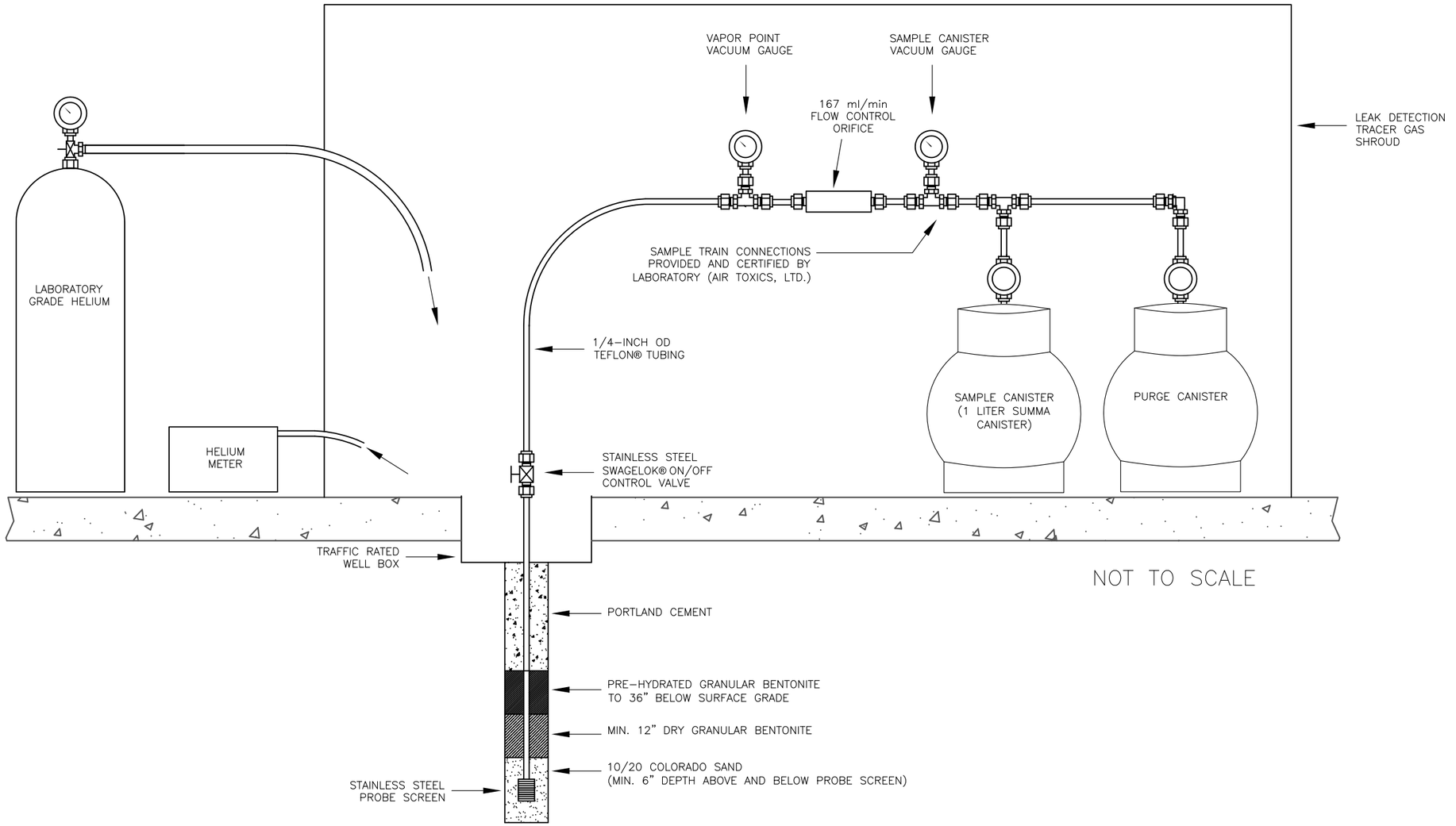
101 Mulford Road
Toledo, Washington

FIGURE 3
Site Map - Active Station Property

DATE: 03/12/2012 | DRAWING: 211556 2012 Site Map.dwg



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101 Mulford Road
Toledo, Washington

FIGURE 4
Typical Sampling Equipment Setup

DATE: 03/12/2012 | DRAWING: 211556_SVSP_RSS.dwg

Table 1
Summary of Soil Sampling Analytical Results
Cowlitz BP (Cowlitz Food and Fuel) / Former Texaco Service Station No. 21-1556
101 Mulford Road, Toledo, Washington

Sample ID	Depth (Feet)	Date Sampled	TPH-GRO	TPH-DRO	TPH-HRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno (1,2,3-cd) pyrene	Total cPAHs	Lead
MW-120-4	4	10/26/2011	< 1.7	< 3.8	< 13	< 0.0087	< 0.0087	< 0.0087	< 0.026	0.0016	0.0020	0.0057	< 0.00084	0.0087	0.0014	< 0.00084	< 0.021	4.60
MW-120-8	8	10/28/2011	27	< 3.5	< 12	< 0.0054	0.013	< 0.035	0.045	0.0064	0.0052	0.0066	0.0024	0.0059	0.00083	0.0035	0.0308	4.95
MW-120-18	18	10/28/2011	< 28	< 5.5	< 18	**< 0.14**	< 0.14	< 0.14	< 0.42	< 0.0061	< 0.0061	< 0.0061	< 0.0061	< 0.0030	< 0.0061	< 0.0061	< 0.0945	15.2
SVSP-1A-2	2	10/27/2011	< 1.3	< 3.2	< 11	< 0.0066	< 0.0066	< 0.0066	< 0.020	---	---	---	---	---	---	---		---
SVSP-1A-6	6	10/27/2011	< 1.8	4.7	< 15	< 0.0092	< 0.0092	< 0.0092	< 0.028	---	---	---	---	---	---	---		---
SVSP-2A-2	2	10/27/2011	< 1.1	< 3.4	15	< 0.0054	< 0.0054	< 0.0054	< 0.016	---	---	---	---	---	---	---		---
SVSP-2A-6	6	10/27/2011	< 1.3	< 3.9	< 13	< 0.0067	0.011	< 0.0067	< 0.020	---	---	---	---	---	---	---		---
SVSP-3A-2	2	10/27/2011	< 1.1	< 3.3	< 11	< 0.0057	< 0.0057	< 0.0057	< 0.017	---	---	---	---	---	---	---		---
SVSP-3A-6	6	10/27/2011	< 1.3	< 3.9	< 13	< 0.0064	< 0.0064	0.011	0.057	---	---	---	---	---	---	---		---
SVSP-4A-2	2	10/27/2011	< 1.1	5.9	82	< 0.0056	< 0.0056	< 0.0056	< 0.017	---	---	---	---	---	---	---		---
SVSP-4A-6	6	10/27/2011	< 1.4	< 3.6	< 12	0.0076	0.039	< 0.0072	< 0.022	---	---	---	---	---	---	---		---
MTCA Method A Cleanup Levels			**30**	**2000**	**2000**	**0.03**	**7**	**6**	**9**	**See Total all Carcinogenic PAHs (Total cPAHs)**							**0.1**	**250**

Notes:
All results reported in milligrams per kilogram (mg/kg) dry weight.
Analytical results in bold indicate concentrations exceeding MTCA Method A cleanup levels.

Table 2
Summary of Groundwater Elevation Data
Cowlitz BP (Cowlitz Food and Fuel) / Former Texaco Service Station No. 21-1556
101 Mulford Road, Toledo, Washington

Monitoring Well ID	Top of Well Casing Elevation (Feet)	Ground Surface Elevation (Feet)	Depth to Water from Top of Casing (Feet)	Groundwater Elevation (Feet)	Depth to Water from Ground Surface (Feet)
MW-110	108.89	109.22	7.98	100.91	8.31
MW-111	107.12	107.32	6.12	101.00	6.32
B-1	107.74	108.06	6.32	101.42	6.64
B-2	108.99	109.30	7.49	101.50	7.80
B-3	108.46	108.92	7.02	101.44	7.48
B-4	107.68	108.02	6.30	101.38	6.64

Notes:
- Elevation measurement relative to North American Vertical Datum of 1988 (NAVD88)
- Depth to water measurement made on December 1, 2012

Table 3
Summary of Vapor Sampling Analytical Results
Cowlitz BP (Cowlitz Food and Fuel) / Former Texaco Service Station No. 21-1556
101 Mulford Road, Toledo, Washington

Sample Location	Sample ID	Date	Benzene ($\mu g/m^3$)	Toluene ($\mu g/m^3$)	Ethylbenzene ($\mu g/m^3$)	m,p-Xylene ($\mu g/m^3$)	0-Xylene ($\mu g/m^3$)	MTBE ($\mu g/m^3$)	Naphthalene ($\mu g/m^3$)	Oxygen (%)	Nitrogen (%)	Carbon Dioxide (%)	Methane (%)	Helium (%)
SVSP-1	SVSP-1-120111	12/1/2011	< 0.45	< 0.53	< 0.61	< 0.61	< 0.61	< 0.50	< 3.7	7.6	82	10	< 0.00014	< 0.070
SVSP-2	SVSP-2-120111	12/1/2011	**340**	17	34	210	19	<10	**< 73**	4.4	87	8.0	0.60	< 0.070
SVSP-2	Duplicate -120111	12/1/2011	**340**	19	26	130	< 16	<13	**< 95**	4.3	87	8.0	0.60	< 0.070
SVSP-3	SVSP-3-120111	12/1/2011	1.0	5.0	1.6	6.8	3.9	< 0.52	< 3.8	1.4	92	6.4	0.24	< 0.072
SVSP-4	SVSP-3-120111	12/1/2011	1.4	3.7	0.77	3.0	1.4	<0.49	< 3.5	1.4	93	4.8	0.63	< 0.068
QA/QC	Equipment Blank	12/2/2011	< 0.48	0.78	< 0.66	0.77	< 0.66	< 0.54	< 4.0	0.75	99	< 0.015	< 0.00015	< 0.076
Ecology Method B Soil Gas Screening Levels - Draft			**3.2**	**22,000**	**4,600**	**460**	**460**	**96**	**14**	**NA**	**NA**	**NA**	**NA**	**NA**

Notes:
Analytical results in bold indicate concentrations exceeding draft Method B soil gas screening levels.

Attachment A:
Laboratory Analytical Reports - Soil

Lancaster Laboratories

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

December 01, 2011

Project: 211556

Submittal Date: 11/01/2011
Group Number: 1274239
PO Number: 0015089649
Release Number: HORNE
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LLI) #
MW-120-4 Grab Soil Sample	6456452
SVSP-2A-2 Grab Soil Sample	6456453
SVSP-2A-6 Grab Soil Sample	6456454
SVSP-3A-2 Grab Soil Sample	6456455
SVSP-4A-2 Grab Soil Sample	6456456
SVSP-3A-6 Grab Soil Sample	6456457
SVSP-1A-2 Grab Soil Sample	6456458
SVSP-4A-6 Grab Soil Sample	6456459
SVSP-1A-6 Grab Soil Sample	6456460
MW-120-8 Grab Soil Sample	6456461
MW-120-18 Grab Soil Sample	6456462
Trip Blank Methanol Sample	6456463

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO	SAIC	Attn: Mike Lange
ELECTRONIC COPY TO	SAIC	Attn: Russ Shropshire

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Analysis Report

Questions? Contact your Client Services Representative
Jill M Parker at (717) 656-2300 Ext. 1241

Respectfully Submitted,

Lawrence M. Taylor
Senior Specialist

Lancaster Laboratories

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Analysis Report

Sample Description: MW-120-4 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456452
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/26/2011 11:30 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1204M

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C SIM**		**mg/kg**	**mg/kg**	
10722	Benzo(a)anthracene	56-55-3	0.0016	0.00084	1
10722	Benzo(a)pyrene	50-32-8	0.0020	0.00084	1
10722	Benzo(b)fluoranthene	205-99-2	0.0057	0.00084	1
10722	Benzo(k)fluoranthene	207-08-9	N.D.	0.00084	1
10722	Chrysene	218-01-9	0.0087	0.00042	1
10722	Dibenz(a,h)anthracene	53-70-3	0.0014	0.00084	1
10722	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.00084	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.7	34.64
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0087	34.64
08179	Ethylbenzene	100-41-4	N.D.	0.0087	34.64
08179	Toluene	108-88-3	N.D.	0.0087	34.64
08179	Total Xylenes	1330-20-7	N.D.	0.026	34.64
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.8	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	13	1
	The reverse surrogate, capric acid, was present at <1%.				
Metals	**SW-846 6020**		**mg/kg**	**mg/kg**	
06135	Lead	7439-92-1	4.60	0.0128	2
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	20.6	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259
Carcinogenic PAHs have been reported for this sample.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10722	PAH SIM 8270 Soil Microwave	SW-846 8270C SIM	1	11306SLH026	11/16/2011 04:24	Gregory J Drahovsky	1

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Analysis Report

Sample Description: MW-120-4 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456452
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/26/2011 11:30 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1204M

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10810	BNA Soil Microwave SIM PAH	SW-846 3546	1	11306SLH026	11/03/2011 13:00	Kelli M Barto	1
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 02:06	Laura M Krieger	34.64
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 02:06	Laura M Krieger	34.64
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/26/2011 11:30	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 11:10	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
06135	Lead	SW-846 6020	1	113051026002A	11/09/2011 18:41	Choon Y Tian	2
11026	SW SW846 ICP-MS Digest	SW-846 3050B	1	113051026002	11/02/2011 11:50	James L Mertz	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-2A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456453
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 10:30 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

2A2SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.1	24
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0054	24
08179	Ethylbenzene	100-41-4	N.D.	0.0054	24
08179	Toluene	108-88-3	N.D.	0.0054	24
08179	Total Xylenes	1330-20-7	N.D.	0.016	24
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.4	1
02214	HRO C24-C40 w/Si Gel	n.a.	15	11	1

The reverse surrogate, capric acid, was present at <1%.
Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside of the method required holding time, and the method blank results are within the acceptance limits. The hold time had expired prior to the second extraction so all results are reported from the original extract. Similar results were obtained in both extracts.

Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	96.2	0.50	1
07103	4.75 mm	n.a.	57.2	0.50	1
07103	3.35 mm	n.a.	47.3	0.50	1
07103	2.36 mm	n.a.	41.5	0.50	1
07103	1.18 mm	n.a.	25.5	0.50	1
07103	0.6 mm	n.a.	15.8	0.50	1
07103	0.3 mm	n.a.	8.8	0.50	1
07103	0.15 mm	n.a.	6.5	0.50	1
07103	0.075 mm	n.a.	5.4	0.50	1
07103	0.064 mm	n.a.	5.0	0.50	1
07103	0.05 mm	n.a.	4.0	0.50	1
07103	0.02 mm	n.a.	2.5	0.50	1
07103	0.005 mm	n.a.	1.0	0.50	1
07103	0.002 mm	n.a.	N.D.	0.50	1
07103	0.001 mm	n.a.	N.D.	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	11.5	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

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Analysis Report

Sample Description: SVSP-2A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456453
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 10:30 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

2A2SV

General Sample Comments

State of Washington Lab Certification No. C259

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 02:42	Laura M Krieger	24
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 02:42	Laura M Krieger	24
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 10:30	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 11:31	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Luz M Groff	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-2A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456454
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 11:00 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

2A6SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.3	25.71
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0067	25.71
08179	Ethylbenzene	100-41-4	N.D.	0.0067	25.71
08179	Toluene	108-88-3	0.011	0.0067	25.71
08179	Total Xylenes	1330-20-7	N.D.	0.020	25.71
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.9	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	13	1
	The reverse surrogate, capric acid, was present at <1%.				
Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	99.9	0.50	1
07103	3.35 mm	n.a.	99.8	0.50	1
07103	2.36 mm	n.a.	99.7	0.50	1
07103	1.18 mm	n.a.	99.7	0.50	1
07103	0.6 mm	n.a.	96.2	0.50	1
07103	0.3 mm	n.a.	90.2	0.50	1
07103	0.15 mm	n.a.	78.0	0.50	1
07103	0.075 mm	n.a.	61.3	0.50	1
07103	0.064 mm	n.a.	57.0	0.50	1
07103	0.05 mm	n.a.	50.0	0.50	1
07103	0.02 mm	n.a.	34.0	0.50	1
07103	0.005 mm	n.a.	19.0	0.50	1
07103	0.002 mm	n.a.	11.0	0.50	1
07103	0.001 mm	n.a.	6.5	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	23.2	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Lancaster Laboratories

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Analysis Report

Sample Description: SVSP-2A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456454
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 11:00 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

2A6SV

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31B	11/07/2011 20:32	Carrie E Miller	25.71
08179	BTEX by 8021	SW-846 8021B	1	11308A31B	11/07/2011 20:32	Carrie E Miller	25.71
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 11:00	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 08:59	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Luz M Groff	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-3A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456455
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 14:00 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

3A2SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.1	26.11
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0057	26.11
08179	Ethylbenzene	100-41-4	N.D.	0.0057	26.11
08179	Toluene	108-88-3	N.D.	0.0057	26.11
08179	Total Xylenes	1330-20-7	N.D.	0.017	26.11
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.3	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	11	1
	The reverse surrogate, capric acid, was present at <1%.				
Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	98.7	0.50	1
07103	4.75 mm	n.a.	58.7	0.50	1
07103	3.35 mm	n.a.	51.1	0.50	1
07103	2.36 mm	n.a.	45.6	0.50	1
07103	1.18 mm	n.a.	28.7	0.50	1
07103	0.6 mm	n.a.	17.6	0.50	1
07103	0.3 mm	n.a.	11.9	0.50	1
07103	0.15 mm	n.a.	9.2	0.50	1
07103	0.075 mm	n.a.	7.5	0.50	1
07103	0.064 mm	n.a.	7.0	0.50	1
07103	0.05 mm	n.a.	6.0	0.50	1
07103	0.02 mm	n.a.	3.0	0.50	1
07103	0.005 mm	n.a.	1.0	0.50	1
07103	0.002 mm	n.a.	N.D.	0.50	1
07103	0.001 mm	n.a.	N.D.	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	9.0	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Lancaster Laboratories

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Analysis Report

Sample Description: SVSP-3A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456455
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 14:00 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

3A2SV

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 03:19	Laura M Krieger	26.11
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 03:19	Laura M Krieger	26.11
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 14:00	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 09:21	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Luz M Groff	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-4A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456456
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 14:10 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

4A2SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.1	26.53
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0056	26.53
08179	Ethylbenzene	100-41-4	N.D.	0.0056	26.53
08179	Toluene	108-88-3	N.D.	0.0056	26.53
08179	Total Xylenes	1330-20-7	N.D.	0.017	26.53
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	5.9	3.2	1
02214	HRO C24-C40 w/Si Gel	n.a.	82	11	1

The reverse surrogate, capric acid, was present at <1%.
The reverse surrogate, capric acid, was present at <1%.
Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside of the method required holding time, and the method blank results are within the acceptance limits. The hold time had expired prior to the second extraction so all results are reported from the original extract. Similar results were obtained in both extracts.

Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	68.6	0.50	1
07103	4.75 mm	n.a.	37.3	0.50	1
07103	3.35 mm	n.a.	32.4	0.50	1
07103	2.36 mm	n.a.	29.0	0.50	1
07103	1.18 mm	n.a.	22.3	0.50	1
07103	0.6 mm	n.a.	15.6	0.50	1
07103	0.3 mm	n.a.	10	0.50	1
07103	0.15 mm	n.a.	7.2	0.50	1
07103	0.075 mm	n.a.	5.9	0.50	1
07103	0.064 mm	n.a.	5.0	0.50	1
07103	0.05 mm	n.a.	4.0	0.50	1
07103	0.02 mm	n.a.	1.5	0.50	1
07103	0.005 mm	n.a.	0.50	0.50	1
07103	0.002 mm	n.a.	N.D.	0.50	1
07103	0.001 mm	n.a.	N.D.	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	5.9	0.50	1

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.

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Analysis Report

Sample Description: SVSP-4A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456456
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 14:10 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

4A2SV

General Sample Comments

State of Washington Lab Certification No. C259

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 03:54	Laura M Krieger	26.53
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 03:54	Laura M Krieger	26.53
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 14:10	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 11:53	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Daniel S Smith	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-3A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456457
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 14:20 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

3A6SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.3	24.75
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0064	24.75
08179	Ethylbenzene	100-41-4	0.011	0.0064	24.75
08179	Toluene	108-88-3	N.D.	0.0064	24.75
08179	Total Xylenes	1330-20-7	0.057	0.019	24.75
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.9	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	13	1
	The reverse surrogate, capric acid, was present at <1%.				
Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	75.1	0.50	1
07103	19 mm	n.a.	71.1	0.50	1
07103	4.75 mm	n.a.	61.4	0.50	1
07103	3.35 mm	n.a.	59.4	0.50	1
07103	2.36 mm	n.a.	55.2	0.50	1
07103	1.18 mm	n.a.	47.5	0.50	1
07103	0.6 mm	n.a.	41.5	0.50	1
07103	0.3 mm	n.a.	37.4	0.50	1
07103	0.15 mm	n.a.	33.7	0.50	1
07103	0.075 mm	n.a.	29.6	0.50	1
07103	0.064 mm	n.a.	28.0	0.50	1
07103	0.05 mm	n.a.	24.0	0.50	1
07103	0.02 mm	n.a.	17.0	0.50	1
07103	0.005 mm	n.a.	10.5	0.50	1
07103	0.002 mm	n.a.	8.0	0.50	1
07103	0.001 mm	n.a.	7.5	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	22.6	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259

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Analysis Report

Sample Description: SVSP-3A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456457
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 14:20 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

3A6SV

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 05:42	Laura M Krieger	24.75
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 05:42	Laura M Krieger	24.75
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 14:20	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 10:48	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Daniel S Smith	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-1A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456458
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 15:00 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1A2SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.3	30.73
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0066	30.73
08179	Ethylbenzene	100-41-4	N.D.	0.0066	30.73
08179	Toluene	108-88-3	N.D.	0.0066	30.73
08179	Total Xylenes	1330-20-7	N.D.	0.020	30.73
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.2	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	11	1
	The reverse surrogate, capric acid, was present at <1%.				
Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	78.5	0.50	1
07103	4.75 mm	n.a.	20.8	0.50	1
07103	3.35 mm	n.a.	16.7	0.50	1
07103	2.36 mm	n.a.	14.1	0.50	1
07103	1.18 mm	n.a.	11.4	0.50	1
07103	0.6 mm	n.a.	8.3	0.50	1
07103	0.3 mm	n.a.	4.6	0.50	1
07103	0.15 mm	n.a.	3.1	0.50	1
07103	0.075 mm	n.a.	2.5	0.50	1
07103	0.064 mm	n.a.	2.0	0.50	1
07103	0.05 mm	n.a.	1.5	0.50	1
07103	0.02 mm	n.a.	0.50	0.50	1
07103	0.005 mm	n.a.	N.D.	0.50	1
07103	0.002 mm	n.a.	N.D.	0.50	1
07103	0.001 mm	n.a.	N.D.	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	6.4	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259

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Analysis Report

Sample Description: SVSP-1A-2 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456458
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 15:00 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1A2SV

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 06:18	Laura M Krieger	30.73
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 06:18	Laura M Krieger	30.73
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 15:00	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 09:42	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Daniel S Smith	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-4A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456459
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 15:15 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

4A6SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.4	30.42
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	0.0076	0.0072	30.42
08179	Ethylbenzene	100-41-4	N.D.	0.0072	30.42
08179	Toluene	108-88-3	0.039	0.0072	30.42
08179	Total Xylenes	1330-20-7	N.D.	0.022	30.42
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.6	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	12	1
	The reverse surrogate, capric acid, was present at <1%.				
Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	81.7	0.50	1
07103	19 mm	n.a.	71.5	0.50	1
07103	4.75 mm	n.a.	43.4	0.50	1
07103	3.35 mm	n.a.	39.2	0.50	1
07103	2.36 mm	n.a.	36.7	0.50	1
07103	1.18 mm	n.a.	29.4	0.50	1
07103	0.6 mm	n.a.	23.1	0.50	1
07103	0.3 mm	n.a.	18.0	0.50	1
07103	0.15 mm	n.a.	14.9	0.50	1
07103	0.075 mm	n.a.	12.7	0.50	1
07103	0.064 mm	n.a.	11.5	0.50	1
07103	0.05 mm	n.a.	10.0	0.50	1
07103	0.02 mm	n.a.	7.5	0.50	1
07103	0.005 mm	n.a.	2.5	0.50	1
07103	0.002 mm	n.a.	1.0	0.50	1
07103	0.001 mm	n.a.	0.50	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	15.8	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259

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Analysis Report

Sample Description: SVSP-4A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456459
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 15:15 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

4A6SV

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31B	11/07/2011 21:44	Carrie E Miller	30.42
08179	BTEX by 8021	SW-846 8021B	1	11308A31B	11/07/2011 21:44	Carrie E Miller	30.42
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 15:15	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 10:26	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Daniel S Smith	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: SVSP-1A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456460
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 16:20 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1A6SV

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.8	31.34
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0092	31.34
08179	Ethylbenzene	100-41-4	N.D.	0.0092	31.34
08179	Toluene	108-88-3	N.D.	0.0092	31.34
08179	Total Xylenes	1330-20-7	N.D.	0.028	31.34
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	4.7	4.4	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	15	1
	The reverse surrogate, capric acid, was present at 1%.				
Wet Chemistry	**ASTM D422**		**% Passing**	**% Passing**	
07103	75 mm	n.a.	100	0.50	1
07103	37.5 mm	n.a.	100	0.50	1
07103	19 mm	n.a.	100	0.50	1
07103	4.75 mm	n.a.	100	0.50	1
07103	3.35 mm	n.a.	99.9	0.50	1
07103	2.36 mm	n.a.	99.8	0.50	1
07103	1.18 mm	n.a.	99.2	0.50	1
07103	0.6 mm	n.a.	93.5	0.50	1
07103	0.3 mm	n.a.	84.3	0.50	1
07103	0.15 mm	n.a.	68.9	0.50	1
07103	0.075 mm	n.a.	53.8	0.50	1
07103	0.064 mm	n.a.	50.0	0.50	1
07103	0.05 mm	n.a.	43.0	0.50	1
07103	0.02 mm	n.a.	29.0	0.50	1
07103	0.005 mm	n.a.	13.0	0.50	1
07103	0.002 mm	n.a.	8.5	0.50	1
07103	0.001 mm	n.a.	4.5	0.50	1
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	31.9	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259

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Analysis Report

Sample Description: SVSP-1A-6 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456460
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/27/2011 16:20 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1A6SV

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 06:54	Laura M Krieger	31.34
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 06:54	Laura M Krieger	31.34
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/27/2011 16:20	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113130008A	11/17/2011 10:04	Elizabeth J Marin	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113130008A	11/09/2011 17:30	David S Schrum	1
07103	Grain Size to 1 um	ASTM D422	1	11323710301A	11/19/2011 13:30	Daniel S Smith	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: MW-120-8 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456461
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/28/2011 09:30 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1208M

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C SIM**		**mg/kg**	**mg/kg**	
10722	Benzo(a)anthracene	56-55-3	0.0064	0.00077	1
10722	Benzo(a)pyrene	50-32-8	0.0052	0.00077	1
10722	Benzo(b)fluoranthene	205-99-2	0.0066	0.00077	1
10722	Benzo(k)fluoranthene	207-08-9	0.0024	0.00077	1
10722	Chrysene	218-01-9	0.0059	0.00038	1
10722	Dibenz(a,h)anthracene	53-70-3	0.00083	0.00077	1
10722	Indeno(1,2,3-cd)pyrene	193-39-5	0.0035	0.00077	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	27	2.1	46.61
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0054	23.31
08179	Ethylbenzene	100-41-4	N.D.	0.035	23.31
08179	Toluene	108-88-3	0.013	0.0054	23.31
08179	Total Xylenes	1330-20-7	0.045	0.016	23.31
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	3.5	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	12	1
	The reverse surrogate, capric acid, was present at 1%.				
Metals	**SW-846 6020**		**mg/kg**	**mg/kg**	
06135	Lead	7439-92-1	4.95	0.0115	2
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	13.1	0.50	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.				

General Sample Comments

State of Washington Lab Certification No. C259
Carcinogenic PAHs have been reported for this sample.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10722	PAH SIM 8270 Soil Microwave	SW-846 8270C SIM	1	11306SLH026	11/20/2011 20:43	Linda M Hartenstine	1

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Analysis Report

Sample Description: MW-120-8 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456461
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/28/2011 09:30 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

1208M

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10810	BNA Soil Microwave SIM PAH	SW-846 3546	1	11306SLH026	11/03/2011 13:00	Kelli M Barto	1
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31B	11/07/2011 22:20	Carrie E Miller	46.61
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 07:30	Laura M Krieger	23.31
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/28/2011 09:30	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113140009A	11/11/2011 23:51	Glorines Suarez-Rivera	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113140009A	11/10/2011 18:00	David S Schrum	1
06135	Lead	SW-846 6020	1	113051026002A	11/09/2011 18:43	Choon Y Tian	2
11026	SW SW846 ICP-MS Digest	SW-846 3050B	1	113051026002	11/02/2011 11:50	James L Mertz	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: MW-120-18 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456462
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/28/2011 09:40 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

18120

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
GC/MS Semivolatiles	**SW-846 8270C SIM**		**mg/kg**	**mg/kg**	
10722	Benzo(a)anthracene	56-55-3	N.D.	0.0061	5
10722	Benzo(a)pyrene	50-32-8	N.D.	0.0061	5
10722	Benzo(b)fluoranthene	205-99-2	N.D.	0.0061	5
10722	Benzo(k)fluoranthene	207-08-9	N.D.	0.0061	5
10722	Chrysene	218-01-9	N.D.	0.0030	5
10722	Dibenz(a,h)anthracene	53-70-3	N.D.	0.0061	5
10722	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.0061	5
Reporting limits were raised due to interference from the sample matrix.					
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	28	381.88
Reporting limits were raised due to sample foaming.					
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.14	381.88
08179	Ethylbenzene	100-41-4	N.D.	0.14	381.88
08179	Toluene	108-88-3	N.D.	0.14	381.88
08179	Total Xylenes	1330-20-7	N.D.	0.42	381.88
Reporting limits were raised due to sample foaming.					
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**mg/kg**	**mg/kg**	
02214	DRO C12-C24 w/Si Gel	n.a.	N.D.	5.5	1
02214	HRO C24-C40 w/Si Gel	n.a.	N.D.	18	1
The reverse surrogate, capric acid, was present at 1%.					
Metals	**SW-846 6020**		**mg/kg**	**mg/kg**	
06135	Lead	7439-92-1	15.2	0.0181	2
Wet Chemistry	**SM20 2540 G**		**%**	**%**	
00111	Moisture	n.a.	45.2	0.50	1
"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.					

General Sample Comments

State of Washington Lab Certification No. C259
Carcinogenic PAHs have been reported for this sample.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

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Analysis Report

Sample Description: MW-120-18 Grab Soil Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456462
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/28/2011 09:40 by AL

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

18120

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10722	PAH SIM 8270 Soil Microwave	SW-846 8270C SIM	1	11306SLH026	11/20/2011 21:16	Linda M Hartenstine	5
10810	BNA Soil Microwave SIM PAH	SW-846 3546	1	11306SLH026	11/03/2011 13:00	Kelli M Barto	1
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31B	11/07/2011 19:13	Carrie E Miller	381.88
08179	BTEX by 8021	SW-846 8021B	1	11308A31B	11/07/2011 19:13	Carrie E Miller	381.88
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/28/2011 09:40	Client Supplied	n.a.
02214	NWTPH-Dx soil w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	113140009A	11/12/2011 00:33	Glorines Suarez-Rivera	1
07024	DRO Alternate Soil Extraction	ECY 97-602 NWTPH-Dx 06/97	1	113140009A	11/10/2011 18:00	David S Schrum	1
06135	Lead	SW-846 6020	1	113051026002A	11/09/2011 18:46	Choon Y Tian	2
11026	SW SW846 ICP-MS Digest	SW-846 3050B	1	113051026002	11/02/2011 11:50	James L Mertz	1
00111	Moisture	SM20 2540 G	1	11308820009A	11/04/2011 19:16	Scott W Freisher	1

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Analysis Report

Sample Description: Trip Blank Methanol Sample
Facility# 211556
101 Mulford Road-Toledo, WA

LLI Sample # SW 6456463
LLI Group # 1274239
Account # 11255

Project Name: 211556

Collected: 10/26/2011

Submitted: 11/01/2011 09:45
Reported: 12/01/2011 14:20

Chevron
6001 Bollinger Canyon Rd L4310
San Ramon CA 94583

556TB

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**mg/kg**	**mg/kg**	
02006	NWTPH-Gx soil C7-C12	n.a.	N.D.	1.0	25
GC Volatiles	**SW-846 8021B**		**mg/kg**	**mg/kg**	
08179	Benzene	71-43-2	N.D.	0.0050	25
08179	Ethylbenzene	100-41-4	N.D.	0.0050	25
08179	Toluene	108-88-3	N.D.	0.0050	25
08179	Total Xylenes	1330-20-7	N.D.	0.015	25

General Sample Comments

State of Washington Lab Certification No. C259

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02006	NWTPH-Gx soil C7-C12	ECY 97-602 NWTPH-Gx	1	11308A31A	11/05/2011 01:31	Laura M Krieger	25
08179	BTEX by 8021	SW-846 8021B	1	11308A31A	11/05/2011 01:31	Laura M Krieger	25
06647	GC-5g Field Preserved MeOH	SW-846 5035	1	201130626049	10/26/2011 00:00	Client Supplied	n.a.

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Analysis Report

Quality Control Summary

Client Name: Chevron Group Number: 1274239
Reported: 12/01/11 at 02:20 PM

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 11306SLH026	Sample number(s): 6456452,6456461-6456462							
Benzo(a)anthracene	N.D.	0.00067	mg/kg	89		74-112		
Benzo(a)pyrene	N.D.	0.00067	mg/kg	91		70-109		
Benzo(b)fluoranthene	N.D.	0.00067	mg/kg	95		60-126		
Benzo(k)fluoranthene	N.D.	0.00067	mg/kg	96		65-130		
Chrysene	N.D.	0.00033	mg/kg	92		79-111		
Dibenz(a,h)anthracene	N.D.	0.00067	mg/kg	95		49-135		
Indeno(1,2,3-cd)pyrene	N.D.	0.00067	mg/kg	94		53-128		
Batch number: 11308A31A	Sample number(s): 6456452-6456453,6456455-6456458,6456460-6456461,6456463							
Benzene	N.D.	0.0020	mg/kg	90	89	76-118	1	30
Ethylbenzene	N.D.	0.0020	mg/kg	93	93	77-115	1	30
NWTPH-Gx soil C7-C12	N.D.	1.0	mg/kg	99	95	67-119	4	30
Toluene	N.D.	0.0020	mg/kg	91	93	80-120	2	30
Total Xylenes	N.D.	0.0050	mg/kg	95	96	78-115	1	30
Batch number: 11308A31B	Sample number(s): 6456454,6456459,6456461-6456462							
Benzene	N.D.	0.0020	mg/kg	90	89	76-118	1	30
Ethylbenzene	N.D.	0.0020	mg/kg	93	93	77-115	1	30
NWTPH-Gx soil C7-C12	N.D.	1.0	mg/kg	99	95	67-119	4	30
Toluene	N.D.	0.0020	mg/kg	91	93	80-120	2	30
Total Xylenes	N.D.	0.0050	mg/kg	95	96	78-115	1	30
Batch number: 113130008A	Sample number(s): 6456452-6456460							
DRO C12-C24 w/Si Gel	N.D.	3.0	mg/kg	72		60-120		
HRO C24-C40 w/Si Gel	11	10.	mg/kg					
Batch number: 113140009A	Sample number(s): 6456461-6456462							
DRO C12-C24 w/Si Gel	N.D.	3.0	mg/kg	60		60-120		
HRO C24-C40 w/Si Gel	N.D.	10.	mg/kg					
Batch number: 113051026002A	Sample number(s): 6456452,6456461-6456462							
Lead	0.0138	0.0101	mg/kg	97		84-112		
Batch number: 11308820009A	Sample number(s): 6456452-6456462							
Moisture				100		99-101		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

MS	MSD	MS/MSD	RPD	BKG	DUP	DUP	Dup RPD

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron Group Number: 1274239
Reported: 12/01/11 at 02:20 PM

Analysis Name	%REC	%REC	Limits	RPD	MAX	Conc	Conc	RPD	Max
Batch number: 11306SLH026	Sample number(s): 6456452,6456461-6456462 UNSPK: 6456452								
Benzo(a)anthracene	87	93	66-114	6	30				
Benzo(a)pyrene	87	93	57-117	6	30				
Benzo(b)fluoranthene	83	92	26-142	9	30				
Benzo(k)fluoranthene	109	117	49-145	7	30				
Chrysene	69	75	41-126	6	30				
Dibenz(a,h)anthracene	56	57	29-138	2	30				
Indeno(1,2,3-cd)pyrene	57	58	25-136	2	30				
Batch number: 113130008A	Sample number(s): 6456452-6456460 BKG: P456395								
DRO C12-C24 w/Si Gel						N.D.	3.6	200* (1)	20
HRO C24-C40 w/Si Gel						N.D.	N.D.	0 (1)	20
Batch number: 113140009A	Sample number(s): 6456461-6456462 BKG: 6456461								
DRO C12-C24 w/Si Gel						N.D.	N.D.	0 (1)	20
HRO C24-C40 w/Si Gel						N.D.	N.D.	0 (1)	20
Batch number: 113051026002A	Sample number(s): 6456452,6456461-6456462 UNSPK: P455594 BKG: P455594								
Lead	160 (2)	346 (2)	75-125	15	20	29.5	31.7	7	20
Batch number: 11308820009A	Sample number(s): 6456452-6456462 BKG: 6456452								
Moisture						20.6	22.7	10	15

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: PAH SIM 8270 Soil Microwave
Batch number: 11306SLH026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
6456452	113	107	120
6456461	134	103	109
6456462	82	80	85
Blank	101	101	110
LCS	98	99	105
MS	106	85	103
MSD	113	104	111
Limits:	53-152	66-118	63-129

Analysis Name: NWTPH-Gx soil C7-C12
Batch number: 11308A31A

	Trifluorotoluene-F	Trifluorotoluene-P
6456452	80	79
6456453	92	91
6456455	84	81
6456456	91	89
6456457	83	78
6456458	93	91
6456460	78	74
6456461		90
6456463	100	101

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron Group Number: 1274239
Reported: 12/01/11 at 02:20 PM

Surrogate Quality Control

Blank	104	98
LCS	115	102
LCSD	107	105
Limits:	61-122	73-117

Analysis Name: NWTPH-Gx soil C7-C12
Batch number: 11308A31B

	Trifluorotoluene-F	Trifluorotoluene-P
6456454	87	80
6456459	98	86
6456461	94	
6456462	87	79
Blank	112	105
LCS	115	102
LCSD	107	105
Limits:	61-122	73-117

Analysis Name: NWTPH-Dx soil w/Si Gel
Batch number: 113130008A

	Orthoterphenyl
6456452	88
6456453	85
6456454	66
6456455	88
6456456	79
6456457	87
6456458	82
6456459	89
6456460	87
Blank	76
DUP	90
LCS	90
Limits:	50-150

Analysis Name: NWTPH-Dx soil w/Si Gel
Batch number: 113140009A

	Orthoterphenyl
6456461	70
6456462	60
Blank	76
DUP	79
LCS	74
Limits:	50-150

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Chevron Northwest Region Analysis Request/Chain of Custody

Lancaster Laboratories
Where quality is a science.

221652

For Lancaster Laboratories use only
Acct. #: 11255 Sample #: 6456452-63 SCR#:

GR# 1274239

WBS # NWRTB-211556-D-LAB

Facility #: 211556
Site Address: 161 Mulford Road, Toledo, WA
Chevron PM: M Horne Lead Consultant: SAIC
Consultant/Office: Bothell, WA
Consultant Prj. Mgr.: R Shroeshire
Consultant Phone #: 425-482-3323 Fax #: 425-485-5566
Sampler: A Lenbrick / G Cisneros
Service Order #: ☐ Non SAR:

Analyses Requested

Preservation Codes

Preservative Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 O = Other

☐ J value reporting needed
☐ Must meet lowest detection limits possible for 8260 compounds

8021 MTBE Confirmation
☐ Confirm MTBE + Naphthalene
☐ Confirm highest hit by 8260
☐ Confirm all hits by 8260
☐ Run ____ oxy s on highest hit
☐ Run ____ oxy s on all hits

Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: Soil	Water	Oil ☐ Air ☐	Total Number of Containers	BTEX + MTBE 8021 ☒ 8260 ☐ Naphth ☐	8260 full scan	Oxygenates ____	TPH G	TPH D Extended Rng. ☒ Silica Gel Cleanup ☒	Lead Total Method 6020 ☐ Diss. ☒	VPH/EPH	NWTPH H HCID ☐ quantification	cPAHs USEPA 8270	Moisture	Grain Size to Lum	Comments / Remarks
MW-120-4	10/26	1130	X		X			4	X			X	X	X			X	X		
SVSP-2A-2	10/27	1030	X		X			4	X			X	X					X		
SVSP-2A-6	10/27	1100	X		X			4	X			X	X					X		
SVSP-3A-2	10/27	1400	X		X			4	X			X	X					X		
SVSP-4A-2	10/27	1410	X		X			4	X			X	X					X		
SVSP-3A-6	10/27	1420	X		X			4	X			X	X					X		
SVSP-1A-2	10/27	1500	X		X			4	X			X	X					X		
SVSP-4A-6	10/27	1515	X		X			4	X			X	X					X		
SVSP-1A-6	10/27	1620	X		X			4	X			X	X					X		
MW-120-8	10/28	0930	X		X			4	X			X	X	X			X	X	Lum. Grain Size	
MW-120-18	10/28	0940	X		X			4	X			X	X	X			X	X		
						Ont		Dup												

Turnaround Time Requested (TAT) (please circle)
(STD. TAT) 72 hour 48 hour
24 hour 4 day 5 day

Data Package Options (please circle if required)
QC Summary Type I - Full
Type VI (Raw Data) Disk / EDD
WIP (RWQCB) Standard Format
Disk ____ Other.

	Date	Time		Date	Time
Relinquished by:	10/31/11	150	Received by:		
Relinquished by:			Received by:		
Relinquished by:			Received by:		
Relinquished by Commercial Carrier: UPS FedEx ☒ Other ____			Received by:	11/1/11	945
Temperature Upon Receipt ____ C° 1.8°-2.7°			Custody Seals Intact? (Yes) No		

3468 Rev. 8/6/01

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
ug	microgram(s)	**mg**	milligram(s)
ml	milliliter(s)	**l**	liter(s)
m3	cubic meter(s)	**ul**	microliter(s)

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

J estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers

A	TIC is a possible aldol-condensation product
B	Analyte was also detected in the blank
C	Pesticide result confirmed by GC/MS
D	Compound quantitated on a diluted sample
E	Concentration exceeds the calibration range of the instrument
N	Presumptive evidence of a compound (TICs only)
P	Concentration difference between primary and confirmation columns >25%
U	Compound was not detected
X,Y,Z	Defined in case narrative

Inorganic Qualifiers

B	Value is <CRDL, but ≥IDL
E	Estimated due to interference
M	Duplicate injection precision not met
N	Spike sample not within control limits
S	Method of standard additions (MSA) used for calculation
U	Compound was not detected
W	Post digestion spike out of control limits
*****	Duplicate analysis not within control limits
+	Correlation coefficient for MSA <0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Attachment B:
Boring Logs

SAIC

18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Monitoring Well: MW-120

Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA
Logged By: A. Lembrick

Date Started: 10/26/2011
Date Completed: 10/28/2011
Driller: Cascade Drilling LP
Drill Method: Airknife/Hollow-Stem

Total Boring Depth: 20 ft
Hole Diameter: 8 in
Well Depth: 17 ft
TOC Elevation: ft

Well Diameter: 2 in
Well Screen: 4-17 ft
Filter Pack: 2/12 Monterey Sand
Well Casing: Sch.40 PVC; 10-Slot

MOISTURE CONTENT	ORGANIC VAPOR (ppm)	BLOWS/6"	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION	WELL DIAGRAM
								0	Asphalt.	Steel Monument
						GP		1	(GP) No soil collected. Mostly cobbles encountered.	Concrete
Moist	0.0							2	(SP) Reddish-brown, loose, fine to medium SAND with 10-15% subrounded gravel and 5% silt; (no odor, no sheen)	
						SP		3		Hydrated Bentonite Chips
Moist	0.0			MW-120-4	G = <1.7 D = <3.8 HO = <13 B = <0.0087			4	Reddish-brown, loose, fine to medium SAND with increasing gravel and 30% cobbles; (no odor, very slight sheen)	Ecology Unique Well ID BHK 028
								5		
								6	(GP) Brown, rounded COBBLES up to 10 inches in diameter with 10% SAND.	
						GP		7		
Wet	70.8	17 50		MW-120-8	G = 27 D = <3.5 HO = <12 B = <0.0054			8	Brown, loose GRAVEL with 40% cobbles, 5-10% sand and 5% silt; (no odor, no sheen)	
								9		
Wet	1.2	50						10	(GP) Brown, dense silty, GRAVEL and cobbles in matrix of 30% silt and 5% coarse sand; (no odor, no sheen)	2/12 Monterey Sand
						GP		11		
								12	Brown, sandy GRAVEL up to 0.5 inches in diameter with 10% silt. (no odor, no sheen)	
Wet	0.0	21 22 30				GP		13	(GP) Dense, COBBLES with brown sand and silt; (no odor, no sheen)	
								14	Brown, dense, sandy GRAVEL with 30% cobbles and 15% silt; (no odor, no sheen)	
Wet	0.0	21 50						15		0.010 Inch Slot
Moist	0.0					OL		16	(OL) Dark brown, organic woody debris; (no odor, no sheen)	
								17	Dark brown, very hard, organic, clayey SILT with medium plasticity; (no odor, no sheen)	
Moist	0.0	21 23 30		MW-120-18	G = <28 D = <5.5 HO = <18 B = <0.14			18		2/12 Monterey Sand
								19		Hydrated Bentonite Chips
								20	Bottom of borehole at 20.0 feet.	

SAIC

18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Soil-Vapor Sampling Probe: SVSP-1A (SVSP-1)

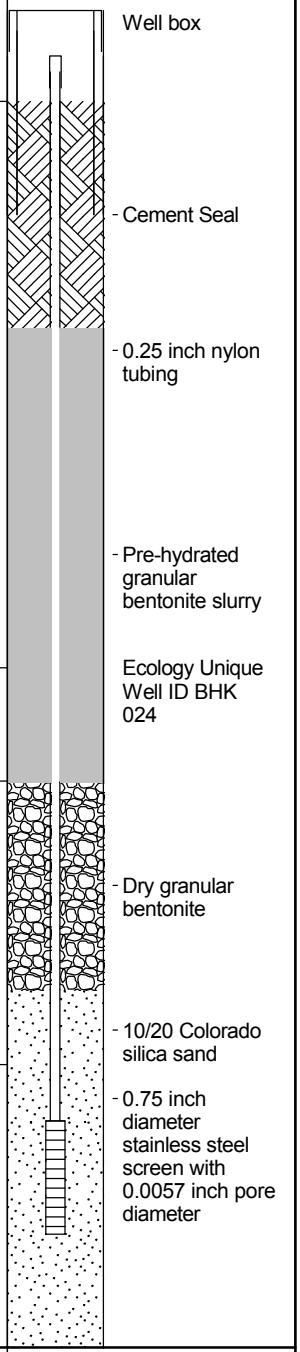
Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA
Logged By: G. Cisneros

Date Started: 10/27/2011
Date Completed: 10/27/2011
Driller: Cascade Drilling LP
Drill Method: Hand Auger

Total Boring Depth: 6 ft
Hole Diameter: 3.25 in
Well Depth: 5.5 ft
Well Diameter: 0.25 in

Well Screen: 5-5.5 ft
Filter Pack: 10/20 Colorado
Well Casing: Nylon Tubing

MOISTURE CONTENT	ORGANIC VAPOR (ppm)	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION
								Concrete
					GP		1	(GP) Brown, medium dense, medium to coarse, sandy GRAVEL with cobbles; (no odor, no sheen)
Moist	0.0		SVSP-1A-2	G = <1.3 D = <3.2 HO = <11 B = <0.0066			2	Same as above; (no odor, no sheen)
					SP		3	(SP) Brown, medium to coarse, gravelly SAND with increasing silt.
					SM		4	(SM) Light brown, medium dense, silty, fine SAND with 30% silt and 10% gravel; (no odor, no sheen)
Moist	0.0						5	(ML) Brown to gray with orange mottle, stiff, sandy SILT with 20% fine sand; (no odor, no sheen)
					ML			
Moist	0.0		SVSP-1A-6	G = <1.8 D = 4.7 HO = <15 B = <0.0092			6	Bottom of borehole at 6.0 feet.



SAIC

18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Soil Boring: SVSP-1B

Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA

Logged By: G. Cisneros
Date Started: 10/27/2011
Date Completed: 10/28/2011

Driller: Cascade Drilling LP
Drill Method: Hand Auger
Total Boring Depth: 7.5 ft

MOISTURE CONTENT	ORGANIC VAPOR (ppm)	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION
							0	Concrete. 6 inches thick
Moist	0.0				GP		1	(GP) Brown, medium dense, medium to coarse sandy GRAVEL; (no odor, no sheen)
							2	
							3	
Moist	0.0				SM		4	(SM) Light brown, medium dense, fine, silty SAND with 30% silt and 10% gravel; (no odor, no sheen)
							5	
Moist	0.0				ML		6	(ML) Brown to gray, stiff, sandy SILT with moderate plasticity; (no odor, no sheen)
							7	Grades to cobbly, gravelly SILT.

Bottom of borehole at 7.5 feet.

SAIC
18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Soil-Vapor Sampling Probe: SVSP-2A (SVSP-2)

Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA
Logged By: G. Cisneros

Date Started: 10/27/2011
Date Completed: 10/27/2011
Driller: Cascade Drilling LP
Drill Method: Hand Auger

Total Boring Depth: 6 ft
Hole Diameter: 3.25 in
Well Depth: 5.5 ft
Well Diameter: 0.25 in

Well Screen: 5-5.5 ft
Filter Pack: 10/20 Colorado
Well Casing: Nylon Tubing

MOISTURE CONTENT	ORGANIC VAPOR (ppm)	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION
							0	Asphalt.
								(SP) Brown, medium dense, coarse, cobbly, sandy GRAVEL.
					SP		1	
Moist	0.3		SVSP-2A-2	G = <1.1 D = <3.4 HO = 15 B = <0.0054			2	Brown, medium dense, cobbly, sandy GRAVEL with coarse sand and 10% cobbles up to 6 inches in diameter; (no odor, no sheen)
							3	
							4	(ML) Dark brown, stiff, gravelly, sandy SILT with 25% medium to coarse sand and 25% gravel; (no odor, no sheen)
Moist	0.3				ML			
							5	Dark brown, stiff, fine, sandy SILT with medium plasticity and roots; (no odor, no sheen)
Moist	0.3		SVSP-2A-6	G = <1.3 D = <3.9 HO = <13 B = <0.0067				
							6	Bottom of borehole at 6.0 feet.

WELL DIAGRAM

- Well box
- Cement Seal
- 0.25 inch nylon tubing
- Pre-hydrated granular bentonite slurry
- Ecology Unique Well ID BHK 025
- Dry granular bentonite
- 10/20 Colorado silica sand
- 0.75 inch diameter stainless steel screen with 0.0057 inch pore diameter

SAIC

18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Soil Boring: SVSP-2B

Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA

Logged By: G. Cisneros
Date Started: 10/27/2011
Date Completed: 10/28/2011

Driller: Cascade Drilling LP
Drill Method: Hand Auger
Total Boring Depth: 7.8 ft

MOISTURE CONTENT	ORGANIC VAPOR (ppm)	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION
							0	Asphalt
					SP			(SP) Brown, medium dense, medium to coarse, gravelly, cobbly SAND.
							1	
							2	
Moist	0.3							Same as above; (no odor, no sheen)
							3	
							4	(ML) Dark brown, stiff, sandy SILT with low plasticity and 5% gravel and cobbles; (no odor, no sheen)
Moist					ML			
							5	
							6	Dark gray, stiff, SILT with moderate plasticity and 10% fine sand that grades to gravelly, cobbly sandy SILT; (no odor, no sheen)
Moist								
							7	
							8	Bottom of borehole at 7.8 feet.

SAIC

18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Soil-Vapor Sampling Probe: SVSP-3A (SVSP-3)

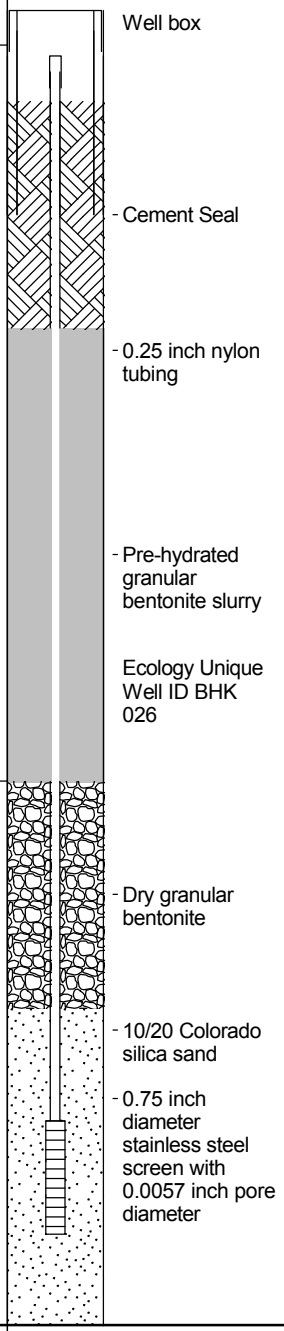
Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA
Logged By: G. Cisneros

Date Started: 10/27/2011
Date Completed: 10/27/2011
Driller: Cascade Drilling LP
Drill Method: Hand Auger

Total Boring Depth: 5.9 ft
Hole Diameter: 3.25 in
Well Depth: 5.5 ft
Well Diameter: 0.25 in

Well Screen: 5-5.5 ft
Filter Pack: 10/20 Colorado
Well Casing: Nylon Tubing

MOISTURE CONTENT	ORGANIC VAPOR (ppm)	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION
							0	Asphalt.
								(SP) Brown, medium dense, medium to coarse, gravelly SAND; (no odor, no sheen)
					SP		1	
Moist	0.0		SVSP-3A-2	G = <1.1 D = <3.3 HO = <11 B = <0.0057			2	Same as above: (no odor, no sheen)
							3	
								(ML) Dark gray, stiff, sandy SILT with moderate plasticity, 15% fine sand, and 10% large gravel; (no odor, no sheen)
Moist	0.0				ML		4	
							5	Dark gray to dark brown, stiff, gravelly, sandy SILT with moderate plasticity, 25% fine sand, and 5% large gravel; (no odor, no sheen)
Moist	0.0		SVSP-3A-6	G = <1.3 D = <3.9 HO = <13 B = <0.0064				
							6	Bottom of borehole at 5.9 feet.



SAIC

18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Soil Boring: SVSP-3B

Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA

Logged By: G. Cisneros
Date Started: 10/27/2011
Date Completed: 10/28/2011

Driller: Cascade Drilling LP
Drill Method: Hand Auger
Total Boring Depth: 6.2 ft

MOISTURE CONTENT	ORGANIC VAPOR (ppm)	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION
							0	Asphalt.
								(SP) Brown, medium dense, medium to coarse, gravelly SAND with cobbles; (no odor, no sheen)
					SP		1	
Moist	0.0						2	
								Same as above; (no odor, no sheen)
							3	
								(ML) Dark gray, stiff, sandy SILT with moderate plasticity and 15% sand; (no odor, no sheen)
							4	
Moist	0.0				ML			
							5	
								Grades to gravelly, cobbly, sandy SILT.
							6	Refusal on large cobble.
								Bottom of borehole at 6.2 feet.

SAIC

18912 North Creek Parkway Ste. 101
Bothell, WA 98011

Soil-Vapor Sampling Probe: SVSP-4A (SVSP-4)

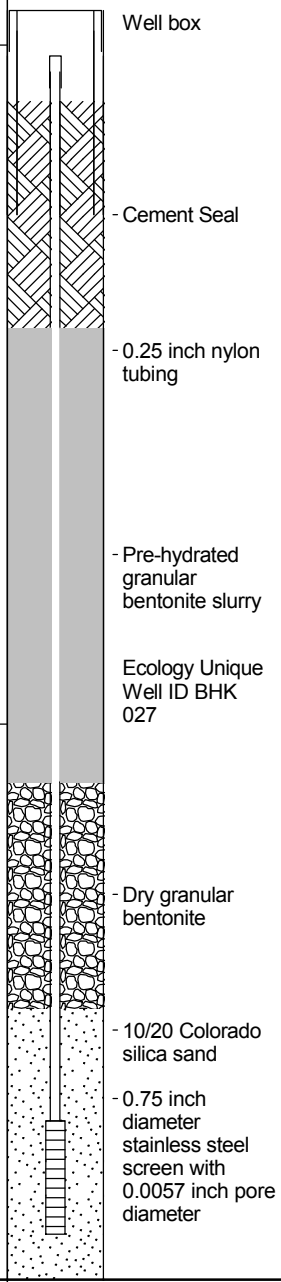
Project: Former Texaco Station No. 211556
Client: Chevron EMC
Location: 101 Mulford Road, Toledo, WA
Logged By: G. Cisneros

Date Started: 10/27/2011
Date Completed: 10/27/2011
Driller: Cascade Drilling LP
Drill Method: Hand Auger

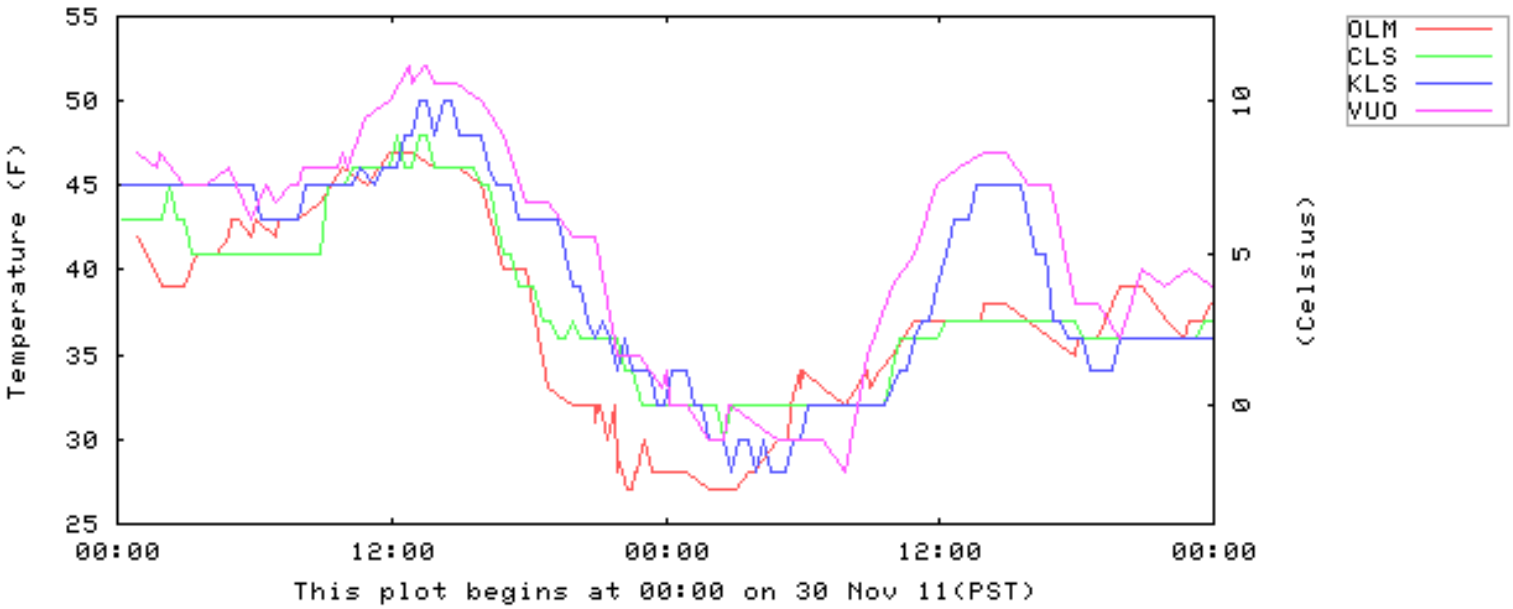
Total Boring Depth: 5.7 ft
Hole Diameter: 3.25 in
Well Depth: 5.5 ft
Well Diameter: 0.25 in

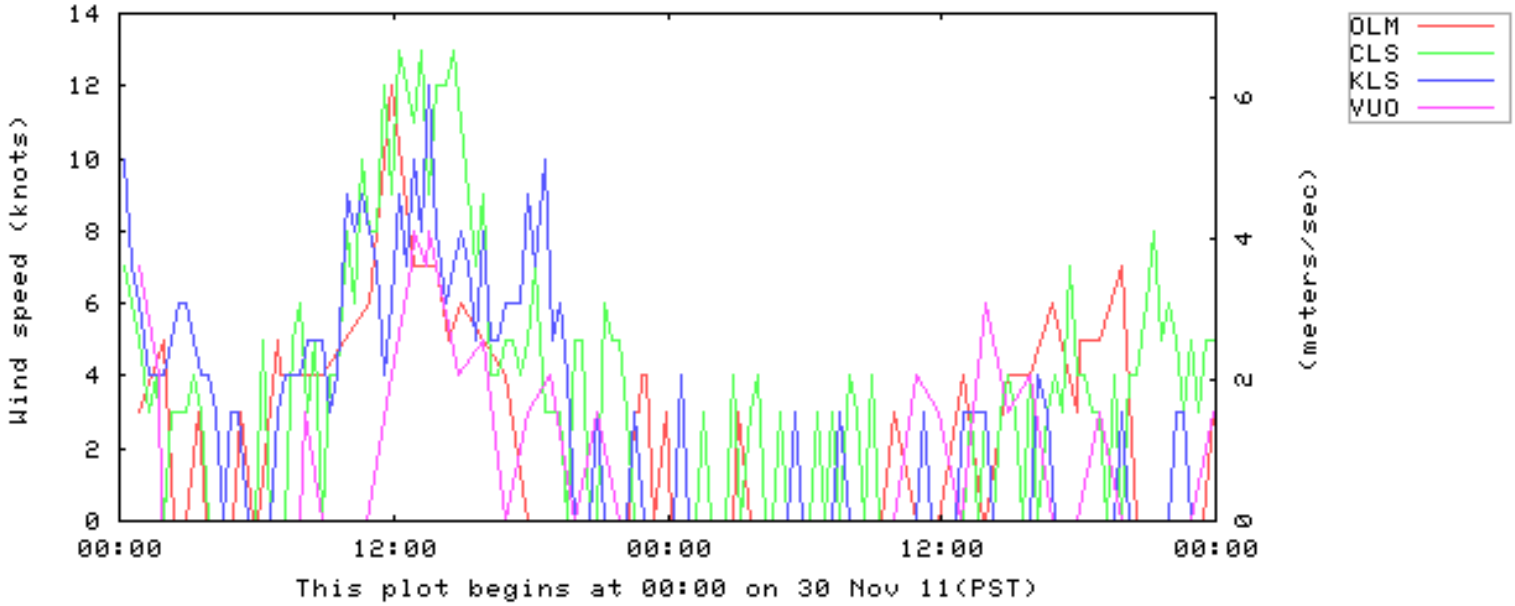
Well Screen: 5-5.5 ft
Filter Pack: 10/20 Colorado
Well Casing: Nylon Tubing

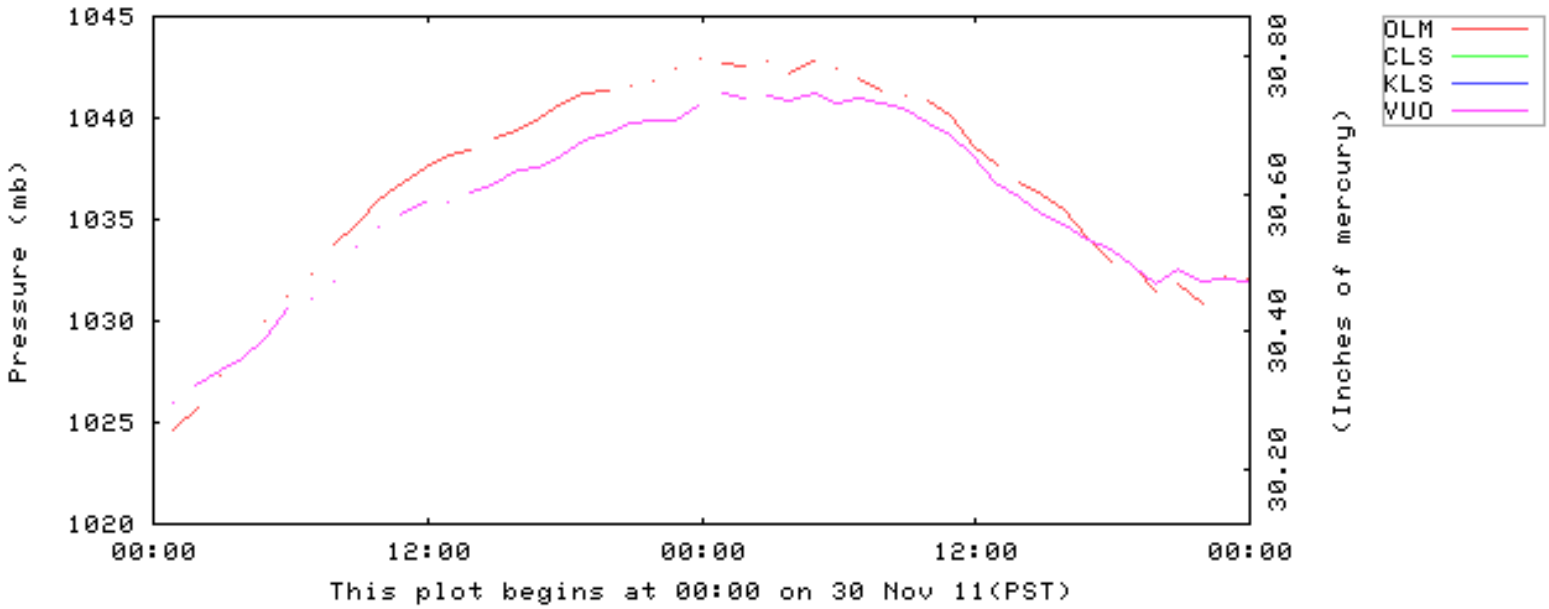
MOISTURE CONTENT	ORGANIC VAPOR (ppm)	SAMP. INTERVAL	ANALYTICAL SAMPLE	Analyical Results (mg/kg)	U.S.C.S. SYMBOL	GRAPHIC LOG	DEPTH (ft)	LITHOLOGY/DESCRIPTION
							0	Asphalt.
								(SP) Brown, medium dense, medium to coarse, gravelly SAND with cobbles; (no odor, no sheen)
Moist	0.0		SVSP-4A-2	G = <1.1 D = 5.9 HO = 82 B = <0.0056	SP		2	
Moist	0.0				ML		4	(ML) Dark gray, stiff, fine sandy, coarse SILT with low plasticity and some roots; (no odor, no sheen)
Moist	0.0		SVSP-4A-6	G = <1.4 D = <3.6 HO = <12 B = <0.0076			5	Dark gray to dark brown, gravelly, sandy SILT with cobbles; (no odor, no sheen)
							6	Bottom of borehole at 5.7 feet.

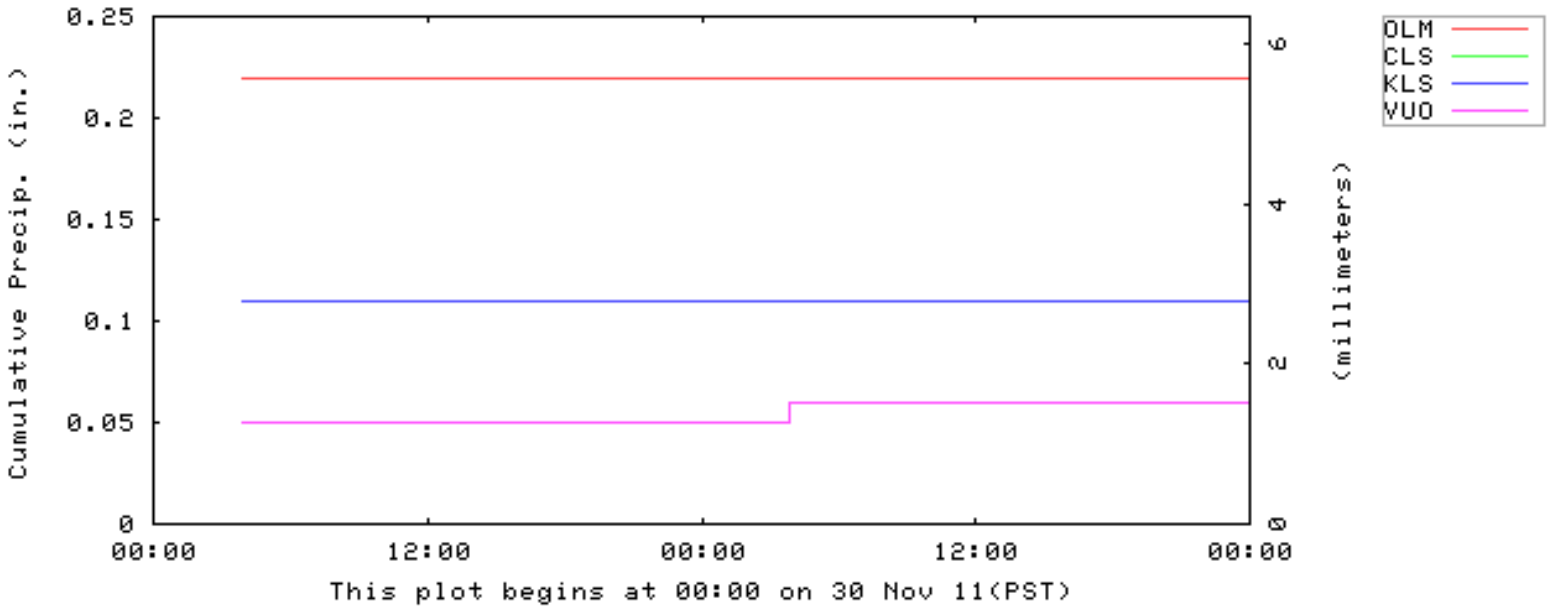


Attachment C:
Weather Data Plots


55
50
45
40
35
30
25
Temperature (F)
10
5
0
(Celsius)
OLM
CLS
KLS
VUO
00:00
12:00
00:00
12:00
00:00
This plot begins at 00:00 on 30 Nov 11(PST)


Wind speed (knots)
(meters/sec)
OLM
CLS
KLS
VUO
00:00
12:00
00:00
12:00
00:00
This plot begins at 00:00 on 30 Nov 11(PST)


1045
1040
1035
1030
1025
1020
Pressure (mb)
30.80
30.60
30.40
30.20
(Inches of mercury)
00:00
12:00
00:00
12:00
00:00
This plot begins at 00:00 on 30 Nov 11(PST)
OLM
CLS
KLS
VUO


Cumulative Precip. (in.)
0.25
0.2
0.15
0.1
0.05
0
6
4
2
0
(millimeters)
OLM
CLS
KLS
VUO
00:00
12:00
00:00
12:00
00:00
This plot begins at 00:00 on 30 Nov 11(PST)

Attachment D:
Laboratory Analytical Reports - Vapor

eurofins | Air Toxics

3/20/2012
Mr. Russ Shropshire
SAIC
18912 Northcreek Parkway
Suite 101
Bothell WA 98011

Project Name: Toledo
Project #: 211556
Workorder #: 1112097AR1

Dear Mr. Russ Shropshire

The following report includes the data for the above referenced project for sample(s) received on 12/6/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1112097AR1

Work Order Summary

CLIENT:	Mr. Russ Shropshire SAIC 18912 Northcreek Parkway Suite 101 Bothell, WA 98011	**BILL TO:**	Mr. Russ Shropshire SAIC 18912 Northcreek Parkway Suite 101 Bothell, WA 98011
PHONE:	425-485-5800	**P.O. #**	SA10020002-TO46
FAX:		**PROJECT #**	211556 Toledo
DATE RECEIVED:	12/06/2011	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	12/14/2011		
DATE REISSUED:	03/20/2012		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVSP-1-120111	Modified TO-15	1.4 "Hg	5 psi
02A	SVSP-2-120111	Modified TO-15	1.4 "Hg	5 psi
03A	SVSP-3-120111	Modified TO-15	2.0 "Hg	5 psi
04A	SVSP-4-120111	Modified TO-15	0.2 "Hg	5 psi
05A	Duplicate-120111	Modified TO-15	1.4 "Hg	5 psi
06A	Equipment Blank	Modified TO-15	3.4 "Hg	5 psi
07A	Lab Blank	Modified TO-15	NA	NA
07B	Lab Blank	Modified TO-15	NA	NA
08A	CCV	Modified TO-15	NA	NA
08B	CCV	Modified TO-15	NA	NA
09A	LCS	Modified TO-15	NA	NA
09AA	LCSD	Modified TO-15	NA	NA
09B	LCS	Modified TO-15	NA	NA
09BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 03/20/12

Laboratory Director

Certfication numbers: AZ Licensure AZ0719, CA NELAP - 02110CA, LA NELAP - 02089,
NY NELAP - 11291, TX NELAP - T104704434-11-3, UT NELAP -CA009332011-1, WA NELAP - C935
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/11 , Expiration date: 06/30/12.
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15
SAIC
Workorder# 1112097AR1

Six 1 Liter Summa Canister (100% Certified) samples were received on December 06, 2011. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	+- 30% RSD with 2 compounds allowed out to < 40% RSD	30% RSD with 4 compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	</= 30% Difference with four allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilutions were performed on samples SVSP-2-120111 and Duplicate-120111 due to the presence of high level non-target species.

THE WORKORDER WAS REISSUED ON 3/20/12 TO CORRECT SAMPLE COLLECTION DATE FOR Equipment Blank DUE TO LABORATORY TRANSCRIPTION ERROR.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV and/or LCS.
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SVSP-1-120111

Lab ID#: 1112097AR1-01A

No Detections Were Found.

Client Sample ID: SVSP-2-120111

Lab ID#: 1112097AR1-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	2.8	110	8.9	340
Toluene	2.8	4.6	10	17
Ethyl Benzene	2.8	7.9	12	34
m,p-Xylene	2.8	49	12	210
o-Xylene	2.8	4.4	12	19

Client Sample ID: SVSP-3-120111

Lab ID#: 1112097AR1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.14	0.32	0.46	1.0
Toluene	0.14	1.3	0.54	5.0
Ethyl Benzene	0.14	0.36	0.62	1.6
m,p-Xylene	0.14	1.6	0.62	6.8
o-Xylene	0.14	0.90	0.62	3.9

Client Sample ID: SVSP-4-120111

Lab ID#: 1112097AR1-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.14	0.43	0.43	1.4
Toluene	0.14	0.98	0.51	3.7
Ethyl Benzene	0.14	0.18	0.59	0.77
m,p-Xylene	0.14	0.70	0.59	3.0
o-Xylene	0.14	0.32	0.59	1.4

Client Sample ID: Duplicate-120111

Lab ID#: 1112097AR1-05A

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: Duplicate-120111

Lab ID#: 1112097AR1-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	3.6	100	12	340
Toluene	3.6	5.2	14	19
Ethyl Benzene	3.6	6.0	16	26
m,p-Xylene	3.6	29	16	130

Client Sample ID: Equipment Blank

Lab ID#: 1112097AR1-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	0.15	0.20	0.57	0.78
m,p-Xylene	0.15	0.18	0.66	0.77

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Client Sample ID: SVSP-1-120111

Lab ID#: 1112097AR1-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120915**	**Date of Collection: 12/1/11 10:27:00 AM**	
Dil. Factor:	**1.40**	**Date of Analysis: 12/9/11 07:30 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.14	Not Detected	0.45	Not Detected
Toluene	0.14	Not Detected	0.53	Not Detected
Ethyl Benzene	0.14	Not Detected	0.61	Not Detected
m,p-Xylene	0.14	Not Detected	0.61	Not Detected
o-Xylene	0.14	Not Detected	0.61	Not Detected
Methyl tert-butyl ether	0.14	Not Detected	0.50	Not Detected
Naphthalene	0.70	Not Detected	3.7	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: SVSP-2-120111

Lab ID#: 1112097AR1-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a121007**	**Date of Collection: 12/1/11 1:29:00 PM**	
Dil. Factor:	**28.0**	**Date of Analysis: 12/10/11 12:11 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	2.8	110	8.9	340
Toluene	2.8	4.6	10	17
Ethyl Benzene	2.8	7.9	12	34
m,p-Xylene	2.8	49	12	210
o-Xylene	2.8	4.4	12	19
Methyl tert-butyl ether	2.8	Not Detected	10	Not Detected
Naphthalene	14	Not Detected	73	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: SVSP-3-120111

Lab ID#: 1112097AR1-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120916**	**Date of Collection: 12/1/11 3:12:00 PM**	
Dil. Factor:	**1.44**	**Date of Analysis: 12/9/11 08:17 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.14	0.32	0.46	1.0
Toluene	0.14	1.3	0.54	5.0
Ethyl Benzene	0.14	0.36	0.62	1.6
m,p-Xylene	0.14	1.6	0.62	6.8
o-Xylene	0.14	0.90	0.62	3.9
Methyl tert-butyl ether	0.14	Not Detected	0.52	Not Detected
Naphthalene	0.72	Not Detected	3.8	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	114	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	109	70-130

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Client Sample ID: SVSP-4-120111

Lab ID#: 1112097AR1-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120918**	**Date of Collection: 12/1/11 4:06:00 PM**	
Dil. Factor:	**1.35**	**Date of Analysis: 12/9/11 10:14 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.14	0.43	0.43	1.4
Toluene	0.14	0.98	0.51	3.7
Ethyl Benzene	0.14	0.18	0.59	0.77
m,p-Xylene	0.14	0.70	0.59	3.0
o-Xylene	0.14	0.32	0.59	1.4
Methyl tert-butyl ether	0.14	Not Detected	0.49	Not Detected
Naphthalene	0.68	Not Detected	3.5	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: Duplicate-120111

Lab ID#: 1112097AR1-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a121009**	**Date of Collection: 12/1/11**	
Dil. Factor:	**36.1**	**Date of Analysis: 12/10/11 01:47 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	3.6	100	12	340
Toluene	3.6	5.2	14	19
Ethyl Benzene	3.6	6.0	16	26
m,p-Xylene	3.6	29	16	130
o-Xylene	3.6	Not Detected	16	Not Detected
Methyl tert-butyl ether	3.6	Not Detected	13	Not Detected
Naphthalene	18	Not Detected	95	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	116	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: Equipment Blank

Lab ID#: 1112097AR1-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120919**	**Date of Collection: 12/2/11 1:05:00 PM**	
Dil. Factor:	**1.51**	**Date of Analysis: 12/9/11 11:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.15	Not Detected	0.48	Not Detected
Toluene	0.15	0.20	0.57	0.78
Ethyl Benzene	0.15	Not Detected	0.66	Not Detected
m,p-Xylene	0.15	0.18	0.66	0.77
o-Xylene	0.15	Not Detected	0.66	Not Detected
Methyl tert-butyl ether	0.15	Not Detected	0.54	Not Detected
Naphthalene	0.76	Not Detected	4.0	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1112097AR1-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120907**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/9/11 12:05 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.10	Not Detected	0.32	Not Detected
Toluene	0.10	Not Detected	0.38	Not Detected
Ethyl Benzene	0.10	Not Detected	0.43	Not Detected
m,p-Xylene	0.10	Not Detected	0.43	Not Detected
o-Xylene	0.10	Not Detected	0.43	Not Detected
Methyl tert-butyl ether	0.10	Not Detected	0.36	Not Detected
Naphthalene	0.50	Not Detected	2.6	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1112097AR1-07B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a121006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/10/11 11:31 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.10	Not Detected	0.32	Not Detected
Toluene	0.10	Not Detected	0.38	Not Detected
Ethyl Benzene	0.10	Not Detected	0.43	Not Detected
m,p-Xylene	0.10	Not Detected	0.43	Not Detected
o-Xylene	0.10	Not Detected	0.43	Not Detected
Methyl tert-butyl ether	0.10	Not Detected	0.36	Not Detected
Naphthalene	0.50	Not Detected	2.6	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: CCV

Lab ID#: 1112097AR1-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120902**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/9/11 08:01 AM**	

Compound	**%Recovery**
Benzene	81
Toluene	84
Ethyl Benzene	93
m,p-Xylene	96
o-Xylene	96
Methyl tert-butyl ether	102
Naphthalene	81

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: CCV

Lab ID#: 1112097AR1-08B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a121002**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/10/11 08:54 AM**	

Compound	**%Recovery**
Benzene	79
Toluene	83
Ethyl Benzene	92
m,p-Xylene	95
o-Xylene	97
Methyl tert-butyl ether	106
Naphthalene	82

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: LCS

Lab ID#: 1112097AR1-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/9/11 08:42 AM**	

Compound	**%Recovery**
Benzene	89
Toluene	93
Ethyl Benzene	102
m,p-Xylene	106
o-Xylene	108
Methyl tert-butyl ether	113
Naphthalene	96

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: LCSD

Lab ID#: 1112097AR1-09AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a120904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/9/11 09:42 AM**	

Compound	**%Recovery**
Benzene	89
Toluene	91
Ethyl Benzene	101
m,p-Xylene	105
o-Xylene	106
Methyl tert-butyl ether	111
Naphthalene	96

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: LCS

Lab ID#: 1112097AR1-09B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a121003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/10/11 09:30 AM**	

Compound	%Recovery
Benzene	88
Toluene	92
Ethyl Benzene	102
m,p-Xylene	106
o-Xylene	107
Methyl tert-butyl ether	110
Naphthalene	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: LCSD

Lab ID#: 1112097AR1-09BB

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a121004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/10/11 10:06 AM**	

Compound	%Recovery
Benzene	88
Toluene	92
Ethyl Benzene	100
m,p-Xylene	103
o-Xylene	106
Methyl tert-butyl ether	110
Naphthalene	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	106	70-130

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3/20/2012
Mr. Russ Shropshire
SAIC
18912 Northcreek Parkway
Suite 101
Bothell WA 98011

Project Name: Toledo
Project #: 211556
Workorder #: 1112097BR1

Dear Mr. Russ Shropshire

The following report includes the data for the above referenced project for sample(s) received on 12/6/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1112097BR1

Work Order Summary

CLIENT:	Mr. Russ Shropshire SAIC 18912 Northcreek Parkway Suite 101 Bothell, WA 98011	**BILL TO:**	Mr. Russ Shropshire SAIC 18912 Northcreek Parkway Suite 101 Bothell, WA 98011
PHONE:	425-485-5800	**P.O. #**	SA10020002-TO46
FAX:		**PROJECT #**	211556 Toledo
DATE RECEIVED:	12/06/2011	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	12/08/2011		
DATE REISSUED:	03/20/2012		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVSP-1-120111	Modified ASTM D-1946	1.4 "Hg	5 psi
02A	SVSP-2-120111	Modified ASTM D-1946	1.4 "Hg	5 psi
03A	SVSP-3-120111	Modified ASTM D-1946	2.0 "Hg	5 psi
04A	SVSP-4-120111	Modified ASTM D-1946	0.2 "Hg	5 psi
05A	Duplicate-120111	Modified ASTM D-1946	1.4 "Hg	5 psi
06A	Equipment Blank	Modified ASTM D-1946	3.4 "Hg	5 psi
07A	Lab Blank	Modified ASTM D-1946	NA	NA
07B	Lab Blank	Modified ASTM D-1946	NA	NA
08A	LCS	Modified ASTM D-1946	NA	NA
08AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Linda D. Frumarx DATE: 03/20/12

Laboratory Director

Certfication numbers: AZ Licensure AZ0719, CA NELAP - 02110CA, LA NELAP - 02089,
NY NELAP - 11291, TX NELAP - T104704434-11-3, UT NELAP -CA009332011-1, WA NELAP - C935
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/11 , Expiration date: 06/30/12.
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
SAIC
Workorder# 1112097BR1

Six 1 Liter Summa Canister (100% Certified) samples were received on December 06, 2011. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Since Nitrogen is used to pressurize samples, the reported Nitrogen values are calculated by adding all the sample components and subtracting from 100%.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A 3-point calibration curve is performed. Quantitation is based on a daily calibration standard which may or may not resemble the composition of the associated samples.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

THE WORK ORDER WAS REISSUED ON 03/20/12 TO CORRECT THE IDENTIFICATION OF SAMPLE EQUIPMENT BLANK DUE TO LABORATORY TRANSCRIPTION ERROR.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: SVSP-1-120111

Lab ID#: 1112097BR1-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	7.6
Nitrogen	0.14	82
Carbon Dioxide	0.014	10

Client Sample ID: SVSP-2-120111

Lab ID#: 1112097BR1-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	4.4
Nitrogen	0.14	87
Carbon Dioxide	0.014	8.0
Methane	0.00014	0.60

Client Sample ID: SVSP-3-120111

Lab ID#: 1112097BR1-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	1.4
Nitrogen	0.14	92
Carbon Dioxide	0.014	6.4
Methane	0.00014	0.24

Client Sample ID: SVSP-4-120111

Lab ID#: 1112097BR1-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	1.4
Nitrogen	0.14	93
Carbon Dioxide	0.014	4.8
Methane	0.00014	0.63

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: Duplicate-120111

Lab ID#: 1112097BR1-05A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	4.3
Nitrogen	0.14	87
Carbon Dioxide	0.014	8.0
Methane	0.00014	0.60

Client Sample ID: Equipment Blank

Lab ID#: 1112097BR1-06A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.15	0.75
Nitrogen	0.15	99

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Client Sample ID: SVSP-1-120111

Lab ID#: 1112097BR1-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120609**	**Date of Collection: 12/1/11 10:27:00 AM**	
Dil. Factor:	**1.40**	**Date of Analysis: 12/6/11 03:03 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	7.6
Nitrogen	0.14	82
Carbon Dioxide	0.014	10
Methane	0.00014	Not Detected
Helium	0.070	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: SVSP-2-120111

Lab ID#: 1112097BR1-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120610**	**Date of Collection: 12/1/11 1:29:00 PM**	
Dil. Factor:	**1.40**	**Date of Analysis: 12/6/11 03:52 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	4.4
Nitrogen	0.14	87
Carbon Dioxide	0.014	8.0
Methane	0.00014	0.60
Helium	0.070	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

eurofins | Air Toxics

Client Sample ID: SVSP-3-120111

Lab ID#: 1112097BR1-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120611**	**Date of Collection: 12/1/11 3:12:00 PM**	
Dil. Factor:	**1.44**	**Date of Analysis: 12/6/11 04:17 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	1.4
Nitrogen	0.14	92
Carbon Dioxide	0.014	6.4
Methane	0.00014	0.24
Helium	0.072	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: SVSP-4-120111

Lab ID#: 1112097BR1-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120612**	**Date of Collection: 12/1/11 4:06:00 PM**	
Dil. Factor:	**1.35**	**Date of Analysis: 12/6/11 06:14 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	1.4
Nitrogen	0.14	93
Carbon Dioxide	0.014	4.8
Methane	0.00014	0.63
Helium	0.068	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: Duplicate-120111

Lab ID#: 1112097BR1-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120614**	**Date of Collection: 12/1/11**	
Dil. Factor:	**1.40**	**Date of Analysis: 12/6/11 07:23 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.14	4.3
Nitrogen	0.14	87
Carbon Dioxide	0.014	8.0
Methane	0.00014	0.60
Helium	0.070	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

eurofins | Air Toxics

Client Sample ID: Equipment Blank

Lab ID#: 1112097BR1-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120615**	**Date of Collection: 12/2/11 1:05:00 PM**	
Dil. Factor:	**1.51**	**Date of Analysis: 12/6/11 07:45 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.15	0.75
Nitrogen	0.15	99
Carbon Dioxide	0.015	Not Detected
Methane	0.00015	Not Detected
Helium	0.076	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1112097BR1-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120605**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/6/11 08:55 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected
Nitrogen	0.10	Not Detected
Carbon Dioxide	0.010	Not Detected
Methane	0.00010	Not Detected

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1112097BR1-07B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120604b**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/6/11 08:33 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Helium	0.050	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 1112097BR1-08A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/6/11 07:00 AM**	

Compound	%Recovery
Oxygen	102
Nitrogen	101
Carbon Dioxide	101
Methane	100
Helium	95

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1112097BR1-08AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9120616**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/6/11 09:00 PM**	

Compound	%Recovery
Oxygen	100
Nitrogen	101
Carbon Dioxide	101
Methane	99
Helium	96

Container Type: NA - Not Applicable

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CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager: Russ Shropshire
Collected by: (Print and Sign) Russ Shropshire
Company: SAIC Email: shropshirer@saic.com
Address: 18912 North Creek Parkway Suite 101 City: Bothell State: WA Zip: 98011
Phone: 425-482-3523 Fax: 425-485-5566

Project Info:
P.O. # Task Order Release # 46
Project # 211556
Project Name: Toledo

Turn Around Time:
☒ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	SVSP-1-120111	36398	12-01-11	10:27	TO-15 Low Level / ASTM D1946	30	3.5		
02A	SVSP-2-120111	36498	12-01-11	13:29		30	3.5		
03A	SVSP-3-120111	35550	12-01-11	15:12		30	3		
04A	SVSP-4-120111	37391	12-01-11	16:06		30	3		
05A	Duplicate-120111	20779	12-01-11	—		30	3.5		
06A	Equipment Blank	34137	12-02-11	13:05		30	3.5		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
R. Shropshire	12/2/2011 1500	[signature]	12-6-11 0946
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:
TO-15 - Report BTEX, MTBE and naphthalene.
ASTM D1946 - Report O_2, CO_2, CH_4, N_2 and He.

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx		4	Good	Yes No None	1112097

Form 1293 rev.11

Attachment E:
Johnson and Ettinger Vapor Modeling Memorandum

Memorandum

To: Project File – Former Texaco Service Station No. 21-1566, Toledo, Washington

From: Russ Shropshire

Date: March 12, 2012

cc:

Re: Johnson and Ettinger Modeling of December 2011 Soil-Vapor Sampling Results

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This memorandum presents the methodology and results of vapor intrusion (VI) modeling that was performed as part of a Tier I VI assessment for the above-referenced site, and which was conducted in accordance with the Washington State Department of Ecology (Ecology) draft guidance document *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (hereafter "Ecology VI guidance").

Per the Ecology VI guidance, the Johnson and Ettinger Model (JEM) was used to predict the maximum (i.e., worst case) concentration of benzene that could be expected in indoor air at the existing service station building, based on the results of recent soil-gas sampling at the site. Modeling results were then compared to indoor air cleanup levels, presented in Table B-1 of the Ecology VI guidance, to determine whether additional assessment activities are warranted.

Specific recommendations regarding the use of the JEM in this capacity is presented in Appendix D of the Ecology VI guidance.

Model

For this exercise, an on-line calculator version of the JEM was used, which is available at the United States Environmental Protection Agency website:

- http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite_forward.html

Use of this specific version of the model is consistent with Ecology VI guidance.

Model Inputs/Assumptions

The following inputs and assumptions were used in this application of the JEM:

- **General Information**
  - **Soil Gas Sampling Result** - 340 micrograms per cubic meter (µg/m^3), based on detection of benzene from sample collected at soil vapor sampling probe SVSP-2, during soil gas sampling event performed on December 1, 2011.

This result represents the maximum concentration of benzene detected in soil gas at the Site.

- **Depth of Sample** - Depth of soil gas sample (5.25 feet) is based on construction of SVSP-2, which is screened from 5 to 5.5 feet below ground surface (bgs). This version of the model also includes a simple sensitivity analysis to address uncertainty regarding sample depth. For this exercise it was assumed that the sample collected would be representative of the sample-probe filter-pack depth (4.5 to 6 feet bgs); therefore, +/- 0.75 feet was used as the value by which the sample depth could vary.
- **Contaminant of Concern** - Benzene is considered to be the primary contaminant of concern that would result in the potential for a vapor intrusion risk.
- **Type of Building** - Building construction for the existing service station building is believed to be slab on grade.
- **Soil Type** - Based on the boring logs for soil vapor sampling probes SVSP-1 through SVSP-4, soils at this site are predominantly sandy gravel to about 3.5 feet bgs, underlain by silty sand and silt. To be conservative, sand was selected as the modeled lithology.
- **Average soil/groundwater temperature** – As suggested in Appendix D of the Ecology guidance document, 55°F was selected.

- **Chemical Properties**
  - All chemical properties input parameters are based on default values assigned by the model for the selected contaminant of concern, benzene.
- **Soil Properties**
  - All soil properties input parameters, except for Q_{soil}, are based on default values assigned by the model for the selected soil type, sand.
  - Use of the default soil properties is consistent with Ecology's recommendation for use of the JEM, with the exception that the soil-gas flow rate into the building (Q_{soil}) should be modified for buildings with significantly larger footprints than 100 square meters (1,076 square feet). The existing service station building at this site is approximately 1,674 square feet; therefore, the value for Q_{soil} was modified using the following formula provided in the Ecology VI guidance:

    Q_{soil} = (5 Liters/min) X (building perimeter in centimeters (cm)/4000 cm)

    Based on use of building dimensions of 54 feet long by 31 feet wide, the building perimeter would be 5, 182 cm; therefore, the resulting value for Q_{soil} is approximately 6.5 Liters/min.

- **Building Properties**
  - Consistent with Ecology VI guidance recommendations, all building properties input parameters are based on the default values assigned by the model, with the following allowable exceptions:
    - Building dimensions used (building footprint area and subsurface foundation area) are based on actual dimensions of the existing service station building (54 feet long by 31 feet wide or approximately 157 meters^2). For this model run, the subsurface foundation area was assumed to be equal to the building footprint area.
    - Building mixing height changed to 2.5 meters per Table D-1 of Ecology VI guidance.
  - Actual building foundation slab thickness is unknown; therefore, the default value (0.1 meter or approximately 4 inches) was used.
- **Exposure Parameters**
  - All exposure input parameters were left as default values for each model run. Exposure parameters have no bearing on indoor air concentrations calculated by the JEM.

Results

The following table provides a summary of the JEM predicted concentration range for benzene in indoor air of the existing service station building, and includes MTCA indoor air cleanup levels for comparison.

JEM Predicted Concentration of Benzene in Indoor Air of Service Station Building			**MTCA Indoor Air Cleanup Levels**	
Low Prediction (µg/m^3)	**Best Estimate (µg/m^3)**	**High Prediction (µg/m^3)**	**Method B (µg/m^3)**	**Method C (µg/m^3)**
0.7126	0.7608	0.8148	0.32	3.2

A complete copy of the JEM indoor air simulation results is included as an attachment to this memorandum.

Discussion of Results

As indicated in the summary table above, JEM predicted concentrations of benzene in indoor air range from 0.7126 to 0.8148 µg/m^3. The range of predicted benzene concentrations is greater than the Method B cleanup level for indoor air, but is below the Method C cleanup level presented in Table B-1 of the Ecology VI guidance.

Given the site's current use as an active service station, comparison to Method C cleanup levels may be more appropriate for evaluation of vapor intrusion to the existing service station building, for the following reasons:

- Method C cleanup levels are based on an adult worker exposure scenario, which is consistent with the current site use exposure conditions; and
- Operations at the site are characterized by the use and storage of petroleum fuels containing benzene, such that background concentrations of benzene would be expected to be elevated in the vicinity of an active service station environment due to automobile exhaust emissions, and benzene volatilization during refueling operations.

Under this site use scenario, JEM results suggest that current levels of benzene in soil gas would not result in benzene concentrations in indoor air of the existing service station building in excess of cleanup levels, based on an adult worker exposure scenario (i.e., Method C). Therefore, while site use remains as the location of an active service station, further VI assessment does not appear warranted.

Ecology VI guidance also suggests that future site use be considered in performing a Tier 1 VI Assessment. In this case, it would not be unreasonable to assume that changes in future site use could result in an exposure scenario in which Method C cleanup levels would not be applicable, resulting in an exposure scenario in which Method B cleanup levels for unrestricted land use would be more appropriate. Results of the Tier 1 assessment performed suggest that there would be the potential for a VI risk under this type of future site use scenario, Therefore, if site use were to change in the future; additional assessment or VI mitigation measures may be warranted at that time.

References

- Ecology, 2009. *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Redial Action – Review Draft*. October.
- EPA, 2004. *User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings*. February.

Attachments

- Screening-Level Johnson and Ettinger Model - Indoor Air Simulation Results

INDOOR AIR SIMULATION RESULTS

Screening-Level Johnson and Ettinger Model

Site Name: Former Texaco Service Station No. 21-1556
Report Date: Sun Mar 11 21:43:23 PDT 2012
Report Generated From: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite_forward.htm
Type of sample: SOIL GAS Concentration = 340[µg/m^3]
Depth of soil gas sample: 5.25ft +/- 0.75ft
Average soil/ground water temperature: 55F

CHEMICAL PROPERTIES
Chemical of Concern: Benzene CAS Number: 71432
Molecular Weight: 78.11 [g/mole] Henrys Constant: 0.1316031 [unitless]
Diffusivity in Air: 8.800e-2 [cm^2/sec] Diffusivity in Water: 9.800e-6 [cm^2/sec]
Unit Risk Factor: 0.0000078 [(µg/m^3)$^{-1}$] Reference Concentration: 0 [mg/m^3]

SOIL PROPERTIES
Soil Type: Sand Total Porosity: 0.375
Unsaturated Zone Moisture Content:
low= 0.053 best estimate= 0.054 high= 0.055
Capillary Zone Moisture Content: 0.253 Height of Capillary Rise: 0.17 [m]
Soil-Gas Flow Rate into Building: 6.5 [L/min]

BUILDING PROPERTIES
Building Type: Slab-on-Grade Air Exchange Rate: 0.25[hr^{-1}]
Building Mixing Height: 2.5[m] Building Footprint Area: 157[m^2]
Subsurface Foundation Area: 157[m^2] Building Crack Ratio: 0.00038[unitless]
Foundation Slab Thickness: 0.1[m]

EXPOSURE PARAMETERS
Exposure Duration: carcinogens 30 [years] non-carcinogens: 30 [years]
Exposure Frequency: carcinogens 350 [days/year] non-carcinogens: 365 [days/year]
Averaging Time: carcinogens 70 [years] non-carcinogens: 30 [years]

JOHNSON & ETTINGER SIMULATION RESULTS
Effective Diffusion Coefficient (D_{eff}): 0.01423[cm^2/s]
Soil Gas to Indoor Air Attenuation Factor (α_{SG}) = 0.002238

[1]Low Indoor Air Prediction: 0.7126 [µg/m^3] or 0.2232 [ppbv]
Cancer Risk of this concentration: 2.284e-6 Hazard Risk of this concentration: 0.

Best Estimate Indoor Air Prediction: 0.7608[µg/m^3] or 0.2383 [ppbv]
Cancer Risk of this concentration: 2.439e-6 Hazard Risk of this concentration: 0.

[2]High Indoor Air Prediction: 0.8148[µg/m^3] or 0.2552 [ppbv]
Cancer Risk of this concentration: 2.612e-6 Hazard Risk of this concentration: 0.

Based on parameter analysis: Advection is the dominant mechanism across foundation.

[1]"Low Prediction" concentrations produced with HIGHEST moisture content and DEEPEST depth to contamination.
[2]"High Prediction" concentrations produced with LOWEST moisture content and SHALLOWEST depth to contamination.